

One Watt Amplifier Transistor

NPN Silicon

MAXIMUM RATINGS

Rating	Symbol	BDC01D	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°C	P_D	1.0 8.0	Watts mW/ $^\circ\text{C}$
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C	P_D	2.5 20	Watts 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	$^\circ\text{C/W}$
Thermal Resistance, Junction to Case	$R_{\theta JC}$	50	$^\circ\text{C/W}$

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 ($I_C = 10\text{ mA}$, $I_B = 0$)	$V_{(BR)C}$ EO	100	—	Vdc
Collector Cutoff Current ($V_{CB} = 100\text{ V}$, $I_E = 0$)	I_{CBO}	—	0.1	μAdc
Emitter Cutoff Current ($I_C = 0$, $V_{EB} = 5.0\text{ V}$)	I_{EBO}	—	100	nAdc

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

Characteristic	Symbol	Min	Max	Unit
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ON CHARACTERISTICS

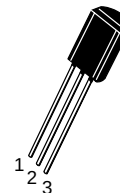
DC Current Gain ($I_C = 100\text{ mA}$, $V_{CE} = 1.0\text{ V}$) ($I_C = 500\text{ mA}$, $V_{CE} = 2.0\text{ V}$)	h_{FE}	40 25	400 —	—
Collector–Emitter Saturation Voltage ⁽¹⁾ ($I_C = 1000\text{ mA}$, $I_B = 100\text{ mA}$)	$V_{CE(sat)}$	—	0.7	Vdc
Collector–Emitter On Voltage ⁽¹⁾ ($I_C = 1000\text{ mA}$,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

DYNAMIC CHARACTERISTICS

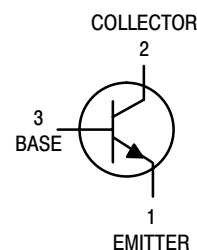
Current Gain Bandwidth Product ($I_C = 200\text{ mA}$, $V_{CE} = 5.0\text{ V}$, $f = 20\text{ MHz}$)	f_T	50	—	MHz
Output Capacitance ($V_{CB} = 10\text{ V}$, $I_E = 0$, $f = 1.0\text{ MHz}$)	C_{ob}	—	30	pF

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

BDC01D



CASE 29-10, STYLE 14
TO-92 (TO-226AE)



BDC01D

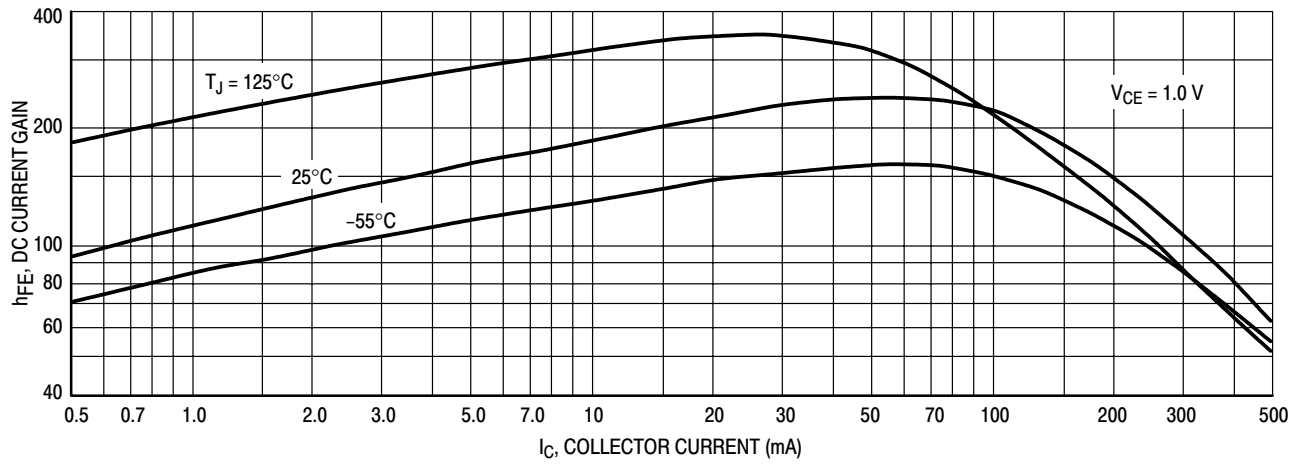


Figure 1. DC Current Gain

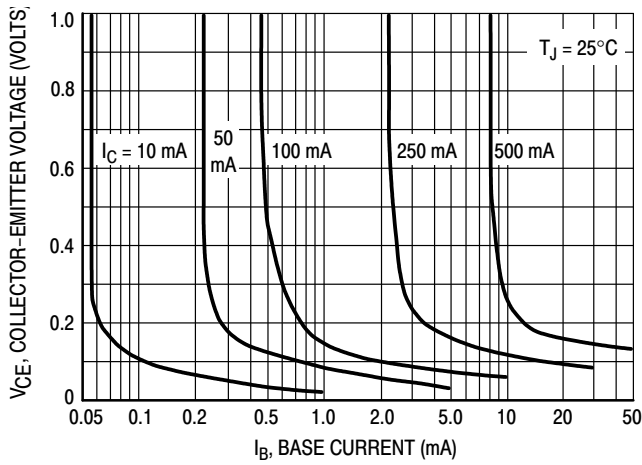


Figure 2. Collector Saturation Region

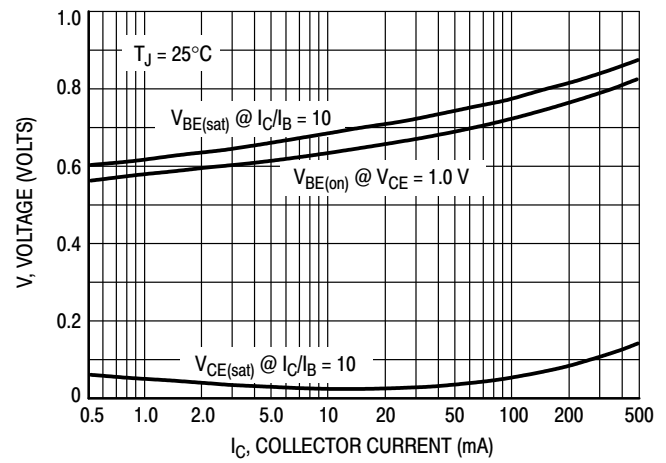


Figure 3. "On" Voltages

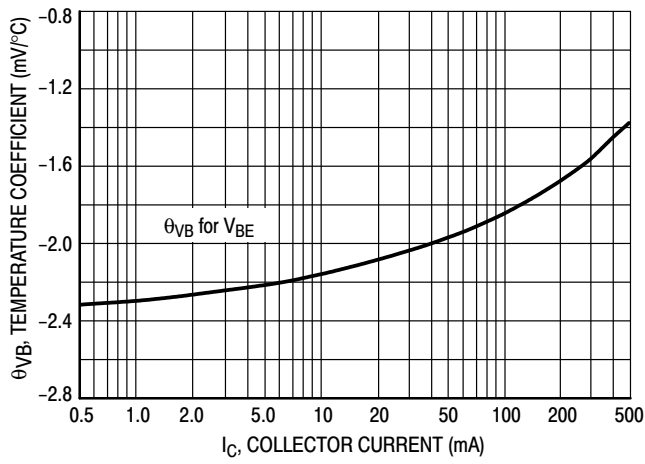


Figure 4. Base-Emitter Temperature Coefficient

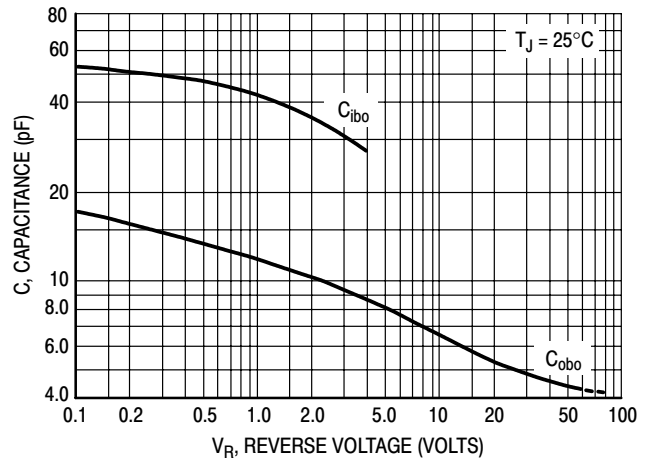


Figure 5. Capacitance

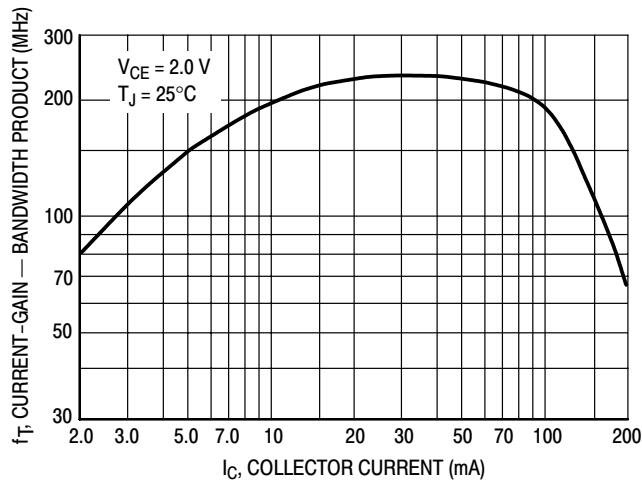


Figure 6. Current-Gain — Bandwidth Product

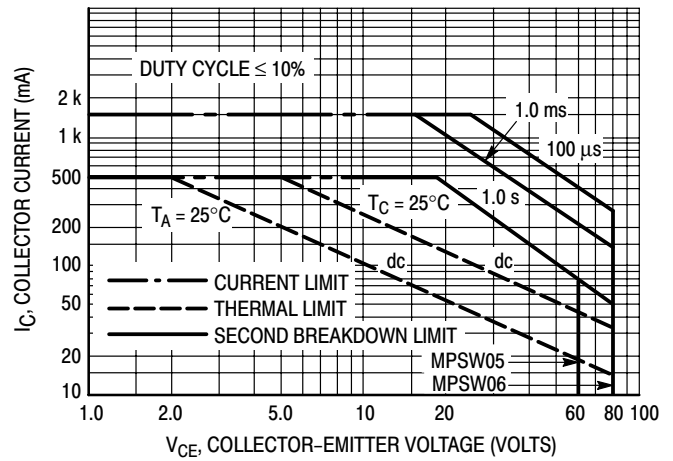
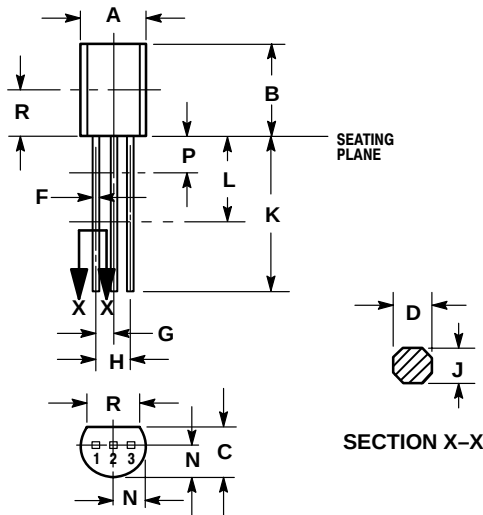


Figure 7. Active Region — Safe Operating Area

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	---

YLE 14:

- PIN 1. EMITTER
2. COLLECTOR
3. BASE

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