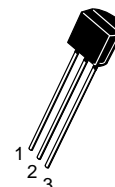
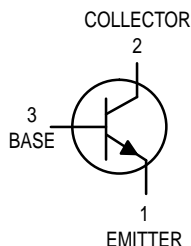


# High Current Transistors

## NPN Silicon

**BC635**  
**BC637**  
**BC639**



CASE 29-04, STYLE 14  
TO-92 (TO-226AA)

### MAXIMUM RATINGS

Rating	Symbol	BC 635	BC 637	BC 639	Unit
Collector–Emitter Voltage	$V_{CEO}$	45	60	80	Vdc
Collector–Base Voltage	$V_{CBO}$	45	60	80	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 $25^\circ\text{C}$	$P_D$	625 5.0			mW mW/ $^\circ\text{C}$
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	1.5 12			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	$R_{\theta JA}$	200	$^\circ\text{C}/\text{W}$
Thermal Resistance, Junction to Case	$R_{\theta JC}$	83.3	$^\circ\text{C}/\text{W}$

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

Characteristic	Symbol	Min	Typ	Max	Unit
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### OFF CHARACTERISTICS

Collector–Emitter Breakdown Voltage <sup>(1)</sup> ( $I_C = 10 \text{ mAdc}$ , $I_E = 0$ )	BC635 BC637 BC639	$V_{(BR)CEO}$	45 60 80	— — —	— — —	Vdc
Collector–Base Breakdown Voltage ( $I_C = 100 \mu\text{Adc}$ , $I_E = 0$ )	BC635 BC637 BC639	$V_{(BR)CBO}$	45 60 80	— — —	— — —	Vdc
Emitter–Base Breakdown Voltage ( $I_E = 10 \mu\text{Adc}$ , $I_C = 0$ )		$V_{(BR)EBO}$	5.0	—	—	Vdc
Collector Cutoff Current ( $V_{CB} = 30 \text{ Vdc}$ , $I_E = 0$ ) ( $V_{CB} = 30 \text{ Vdc}$ , $I_E = 0$ , $T_A = 125^\circ\text{C}$ )		$I_{CBO}$	— —	— —	100 10	nAdc $\mu\text{Adc}$

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

**BC635 BC637 BC639****ELECTRICAL CHARACTERISTICS** ( $T_A = 25^\circ\text{C}$  unless otherwise noted) (Continued)

Characteristic	Symbol	Min	Typ	Max	Unit
<b>ON CHARACTERISTICS<sup>(1)</sup></b>					
DC Current Gain ( $I_C = 5.0\text{ mA}$ , $V_{CE} = 2.0\text{ Vdc}$ ) ( $I_C = 150\text{ mA}$ , $V_{CE} = 2.0\text{ Vdc}$ )  ( $I_C = 500\text{ mA}$ , $V_{CE} = 2.0\text{ V}$ )	$h_{FE}$	25 40 40 40 25	— — — — —	— 250 160 160 —	—
Collector–Emitter Saturation Voltage ( $I_C = 500\text{ mA}$ , $I_B = 50\text{ mA}$ )	$V_{CE(sat)}$	—	—	0.5	Vdc
Base–Emitter On Voltage ( $I_C = 500\text{ mA}$ , $V_{CE} = 2.0\text{ Vdc}$ )	$V_{BE(on)}$	—	—	1.0	Vdc
<b>DYNAMIC CHARACTERISTICS</b>					
Current–Gain — Bandwidth Product ( $I_C = 50\text{ mA}$ , $V_{CE} = 2.0\text{ Vdc}$ , $f = 100\text{ MHz}$ )	$f_T$	—	200	—	MHz
Output Capacitance ( $V_{CB} = 10\text{ Vdc}$ , $I_E = 0$ , $f = 1.0\text{ MHz}$ )	$C_{ob}$	—	7.0	—	pF
Input Capacitance ( $V_{EB} = 0.5\text{ Vdc}$ , $I_C = 0$ , $f = 1.0\text{ MHz}$ )	$C_{ib}$	—	50	—	pF

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

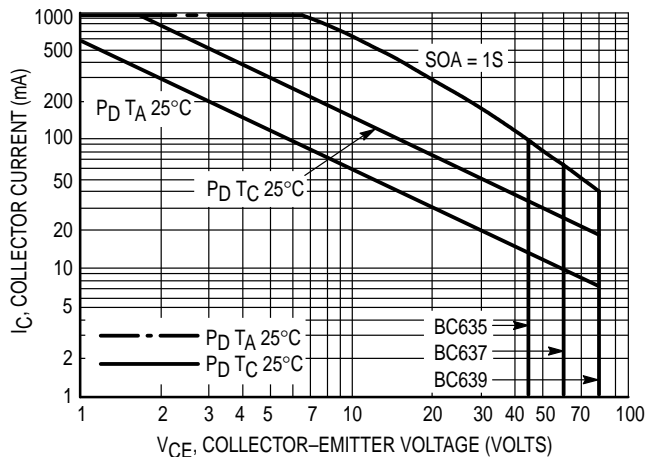


Figure 1. Active Region Safe Operating Area

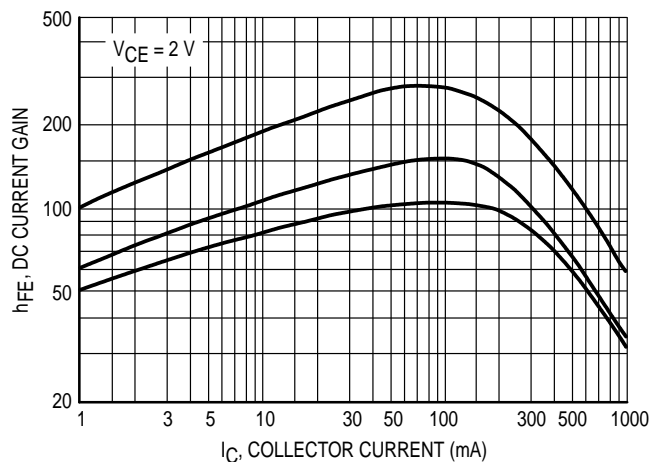


Figure 2. DC Current Gain

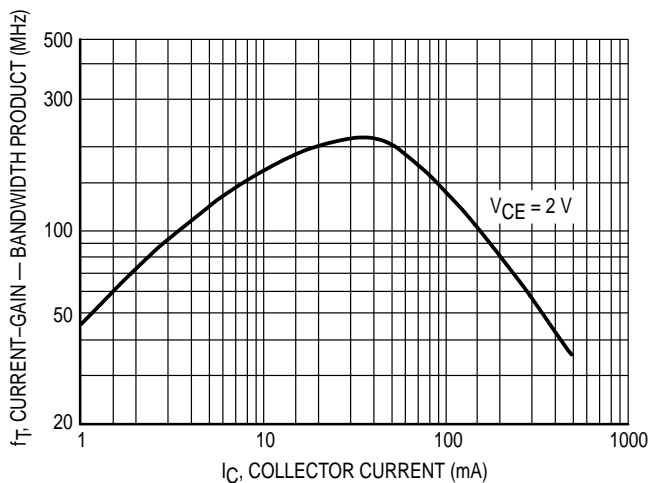


Figure 3. Current-Gain — Bandwidth Product

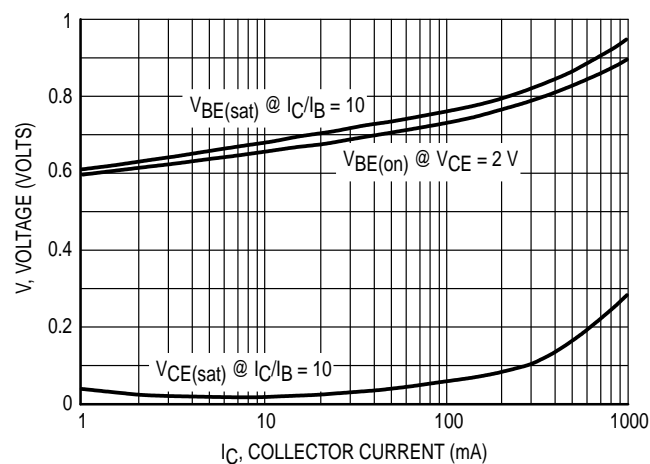


Figure 4. "Saturation" and "On" Voltages

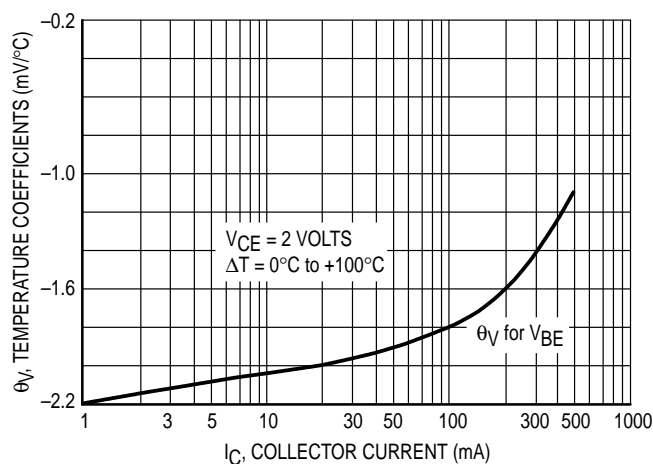
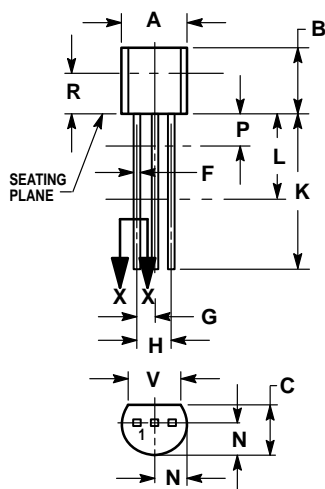


Figure 5. Temperature Coefficients

## PACKAGE DIMENSIONS



SECTION X-X

**CASE 029-04  
(TO-226AA)  
ISSUE AD**


## 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. DIMENSION 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	4.45	5.20
B	0.170	0.210	4.32	5.33
C	0.125	0.165	3.18	4.19
D	0.016	0.022	0.41	0.55
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	0.015	0.020	0.39	0.50
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	0.115	—	2.93	—
V	0.135	—	3.43	—

## STYLE 14:

1. EMITTER
2. COLLECTOR
3. BASE

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