

BC635, BC637, BC639, BC639-16

High Current Transistors

NPN Silicon



ON Semiconductor

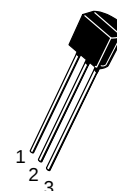
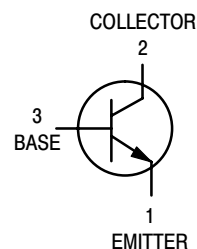
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MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage BC635 BC637 BC639	V_{CEO}	45 60 80	Vdc
Collector-Base Voltage BC635 BC637 BC639	V_{CBO}	45 60 80	Vdc
Emitter-Base Voltage	V_{EBO}	5.0	Vdc
Collector Current — Continuous	I_C	1.0	Adc
Total Device Dissipation @ $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D	625 5.0	mW mW/ $^\circ\text{C}$
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C	P_D	800 12	mW 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	$^\circ\text{C/W}$
Thermal Resistance, Junction to Case	$R_{\theta JC}$	83.3	$^\circ\text{C/W}$



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

ORDERING INFORMATION

Device	Package	Shipping
BC635RL1	TO-92	2000/Tape & Reel
BC635ZL1	TO-92	2000/Ammo Pack
BC637	TO-92	5000 Units/Box
BC639	TO-92	5000 Units/Box
BC639RL1	TO-92	2000/Tape & Reel
BC639ZL1	TO-92	2000/Ammo Pack
BC639-16ZL1	TO-92	2000/Ammo Pack

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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 (1) ($I_C = 10\ \mu\text{Adc}$, $I_B = 0$)	BC635 BC637 BC639	$V_{(BR)CEO}$	45 60 80	— — —	— — —	Vdc
Collector–Emitter Zero–Gate Breakdown Voltage (1) ($I_C = 100\ \mu\text{Adc}$, $I_B = 0$)	BC639–16	$V_{(BR)CES}$	120	—	—	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 μAdc

ON CHARACTERISTICS (1)

DC Current Gain ($I_C = 5.0\ \text{mAdc}$, $V_{CE} = 2.0\ \text{Vdc}$) ($I_C = 150\ \text{mAdc}$, $V_{CE} = 2.0\ \text{Vdc}$)	BC635 BC637 BC639 BC639–16ZLT1	h_{FE}	25 40 40 40 100 25	— — — — — —	— 250 160 160 250 —	—
Collector–Emitter Saturation Voltage ($I_C = 500\ \text{mAdc}$, $I_B = 50\ \text{mAdc}$)		$V_{CE(sat)}$	—	—	0.5	Vdc
Base–Emitter On Voltage ($I_C = 500\ \text{mAdc}$, $V_{CE} = 2.0\ \text{Vdc}$)		$V_{BE(on)}$	—	—	1.0	Vdc

DYNAMIC CHARACTERISTICS

Current–Gain — Bandwidth Product ($I_C = 50\ \text{mAdc}$, $V_{CE} = 2.0\ \text{Vdc}$, $f = 100\ \text{MHz}$)		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 $\leq 300\ \mu\text{s}$, Duty Cycle 2.0%.

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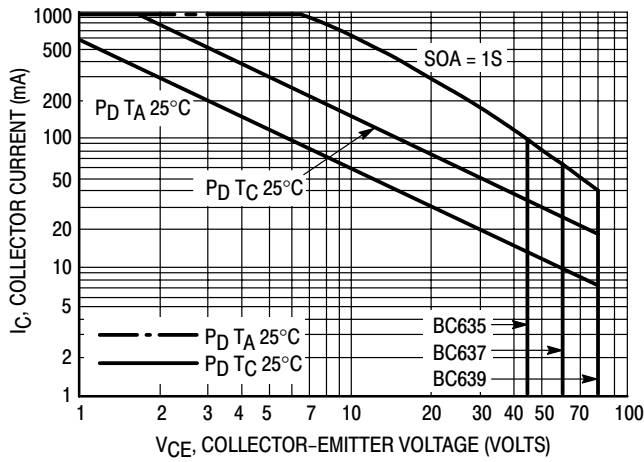


Figure 1. Active Region Safe Operating Area

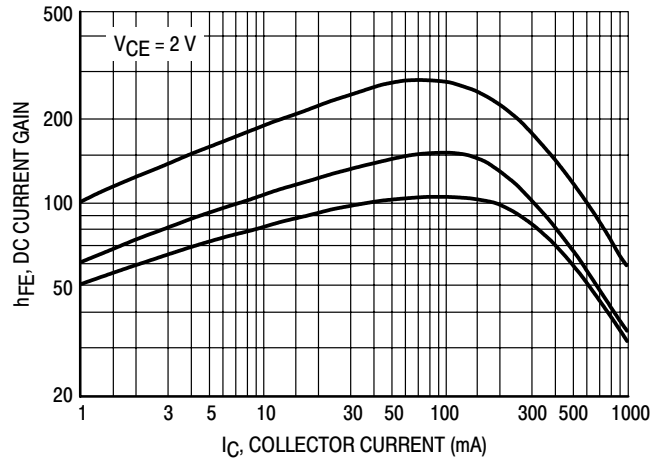


Figure 2. DC Current Gain

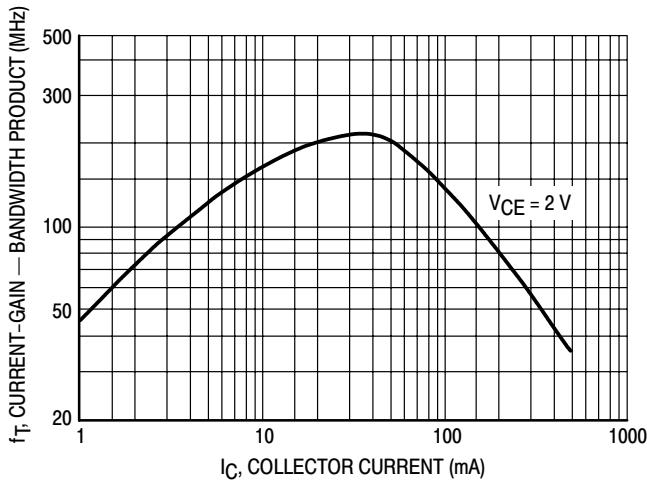


Figure 3. Current-Gain — Bandwidth Product

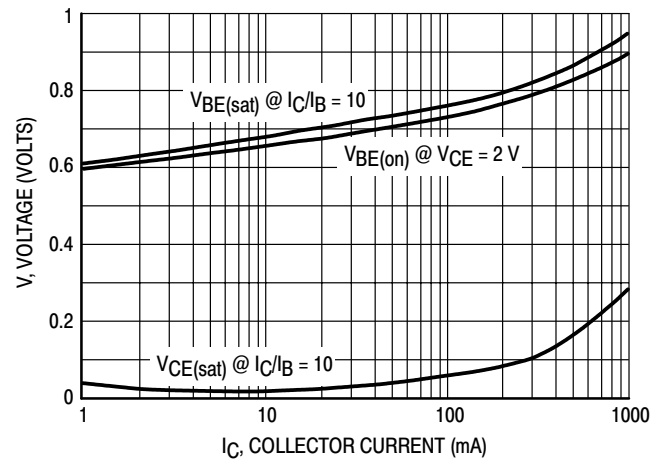


Figure 4. "Saturation" and "On" Voltages

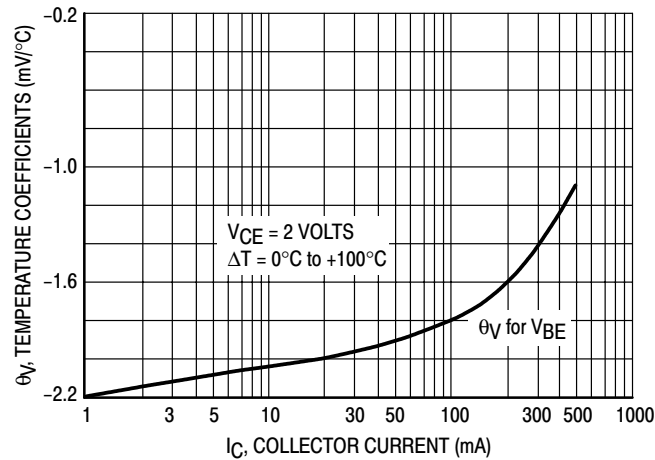
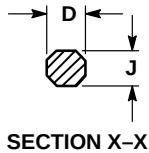
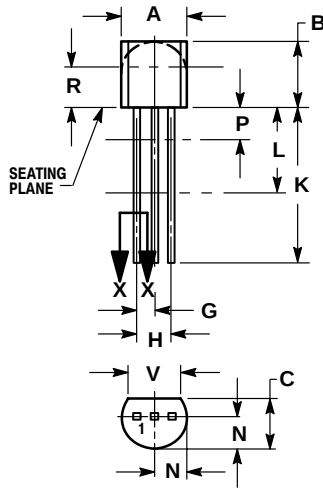


Figure 5. Temperature Coefficients

BC635, BC637, BC639, BC639-16

PACKAGE DIMENSIONS

TO-92
(TO-226)
CASE 29-11
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. 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	0.021	0.407	0.533
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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