High Current Transistors

PNP Silicon

Features

• Pb-Free Packages are Available*

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage BC638 BC640	V _{CEO}	-60 -80	Vdc
Collector-Base Voltage BC638 BC640	V _{CBO}	-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°C Derate above 25°C	P _D	625 5.0	mW mW/°C
Total Device Dissipation @ T _C = 25°C Derate above 25°C	P _D	1.5 12	W mW/°C
Operating and Storage Junction Temperature Range	T _J , T _{stg}	-55 to +150	°C

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.

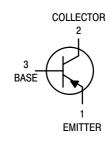
THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction–to–Ambient	$R_{\theta JA}$	200	°C/W
Thermal Resistance, Junction–to–Case	$R_{\theta JC}$	83.3	°C/W



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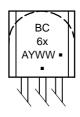
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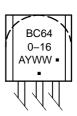




TO-92 CASE 29 STYLE 14

MARKING DIAGRAMS





BC6x = Device Code x = 3 or 4

BC640-16 = Specific Device Code A = Assembly Location

Y = Year WW = Work Week • Pb-Free Package

(Note: Microdot may be in either location)

ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 2 of this data sheet.

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

ORDERING INFORMATION

Device	Package	Shipping	
BC638	TO-92	5000 Units / Box	
BC638G	TO-92 (Pb-Free)	5000 Units / Box	
BC638ZL1	TO-92	2000 Units / Ammo Box	
BC638ZL1G	TO-92 (Pb-Free)	2000 Units / Ammo Box	
BC640	TO-92	5000 Units / Box	
BC640G	TO-92 (Pb-Free)	5000 Units / Box	
BC640ZL1	TO-92	2000 Units / Ammo Box	
BC640ZL1G	TO-92 (Pb-Free)	2000 Units / Ammo Box	
BC640-16	TO-92	5000 Units / Box	
BC640-16G	TO-92 (Pb-Free)	5000 Units / Box	

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

Characteristic		Symbol	Min	Тур	Max	Unit
OFF CHARACTERISTICS			1	•	•	
Collector – Emitter Breakdown Voltage (I _C = –10 mAdc, I _B = 0)	BC638 BC640	V _{(BR)CEO}	-60 -80	_ _	_ _	Vdc
Collector – Base Breakdown Voltage ($I_C = -100 \mu Adc, I_E = 0$)	BC638 BC640	V _{(BR)CBO}	-60 -80	- -	_ _	Vdc
Emitter – Base Breakdown Voltage ($I_E = -10 \mu Adc, I_C = 0$)		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 (Note 1)	-		•	•	•	·•
DC Current Gain $(I_C = -5.0 \text{ mAdc}, V_{CE} = -2.0 \text{ Vdc})$ $(I_C = -150 \text{ mAdc}, V_{CE} = -2.0 \text{ Vdc})$	BC638 BC640 BC640-16	h _{FE}	25 40 40 100 25	- - -	- 160 160 250	-
(I _C = -500 mA, V _{CE} = -2.0 V) Collector – Emitter Saturation Voltage (I _C = -500 mAdc, I _B = -50 mAdc)		V _{CE(sat)}	- -	-0.25 -0.5	-0.5 -	Vdc
Base – Emitter On Voltage (I _C = –500 mAdc, V _{CE} = –2.0 Vdc)		V _{BE(on)}	-	-	-1.0	Vdc
DYNAMIC CHARACTERISTICS						
Current Gain – Bandwidth Product (I _C = -50 mAdc, V _{CE} = -2.0 Vdc, f = 100 MHz)		f _T	-	150	_	MHz
Output Capacitance $(V_{CB} = -10 \text{ Vdc}, I_E = 0, f = 1.0 \text{ MHz})$		C _{ob}	-	9.0	-	pF
Input Capacitance $(V_{EB} = -0.5 \text{ Vdc}, I_C = 0, f = 1.0 \text{ MHz})$		C _{ib}	-	110	_	pF

^{1.} Pulse Test: Pulse Width \leq 300 μ s, Duty Cycle 2.0%.

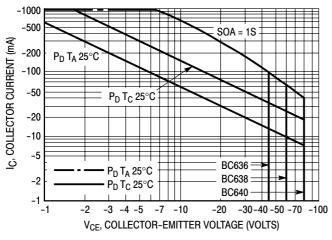
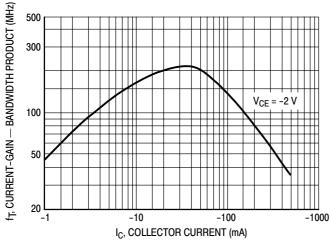


Figure 1. Active Region Safe Operating Area

Figure 2. DC Current Gain



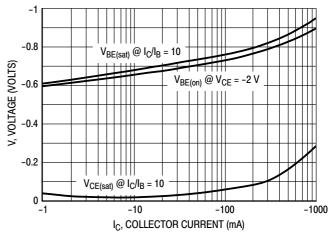


Figure 3. Current Gain Bandwidth Product

Figure 4. "Saturation" and "On" Voltages

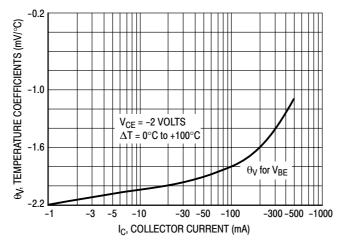
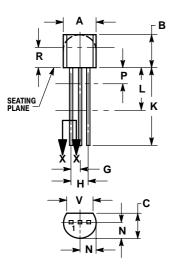


Figure 5. Temperature Coefficients

PACKAGE DIMENSIONS

TO-92 (TO-226) CASE 29-11 ISSUE AL





NOTES

- DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982. CONTROLLING DIMENSION: INCH.
- CONTOUR OF PACKAGE BEYOND DIMENSION R IS UNCONTROLLED.
- LEAD DIMENSION IS UNCONTROLLED IN P AND BEYOND DIMENSION K MINIMUM.

	INC	HES	MILLIN	IETERS
DIM	MIN	MAX	MIN	MAX
Α	0.175	0.205	4.45	5.20
В	0.170	0.210	4.32	5.33
С	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
Н	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:

PIN 1. EMITTER

2. COLLECTOR

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