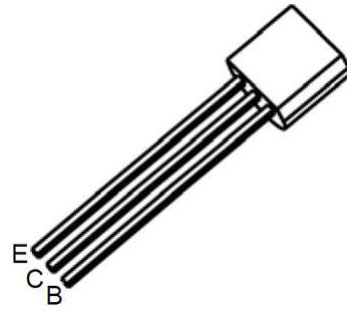
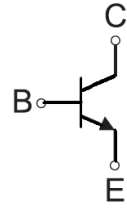


NPN TRANSISTOR
FEATURES

- General purpose switching and amplification
- Complementary to BC640

MECHANICAL DATA

- Case: TO-92
- Case material: Molded plastic. UL flammability 94V-0
- Terminals: Tin plated, solderable per MIL-STD-202, method 208
- Weight: 2.30grams(approximate)
- Marking:BC639


TO-92

Equivalent circuit
MAXIMUM RATINGS ($T_A=25^{\circ}\text{C}$ unless otherwise specified)

Parameter	Symbol	Value	Unit
Collector-emitter voltage	V_{CBO}	100	V
Collector-emitter voltage	V_{CEO}	80	V
Emitter-base voltage	V_{EBO}	5	V
Collector current -continuous	I_C	1	A
Collector power dissipation	P_C	0.83	W
Junction temperature	T_J	150	$^{\circ}\text{C}$
Storage temperature	T_{STG}	-65 ~ 150	$^{\circ}\text{C}$

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

Parameter	Symbol	Min	Max	Unit	Conditions
Collector-base breakdown voltage	$V_{(BR)CBO}$	100		V	$I_C=-100\mu\text{A}, I_E=0$
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	80		V	$I_C=-10\text{mA}, I_B=0$
Emitter-base breakdown voltage	$V_{(BR)EBO}$	5		V	$I_E=-10\mu\text{A}, I_C=0$
Collector cut-off current	I_{CBO}		100	nA	$V_{CB}=30\text{V}, I_E=0$
Emitter cut-off current	I_{EBO}		10	μA	$V_{EB}=5\text{V}, I_C=0$
DC current gain	$h_{FE(1)}$	25			$V_{CE}=2\text{V}, I_C=5\text{mA}$
	$h_{FE(2)}$	100		250	$V_{CE}=2\text{V}, I_C=150\text{mA}$
	$h_{FE(3)}$	25			$V_{CE}=2\text{V}, I_C=500\text{mA}$
Collector-emitter saturation voltage	$V_{CE(sat)}$		0.5	V	$I_C=500\text{mA}, I_B=50\text{mA}$
Base-emitter voltage	V_{BE}		1	V	$V_{CE}=-2\text{V}, I_C=-500\text{mA}$
Transition frequency	f_T	100		MHz	$V_{CE}=5\text{V}, I_C=10\text{mA}, f=50\text{MHz}$

NPN TRANSISTOR

TYPICAL CHARACTERISTICS

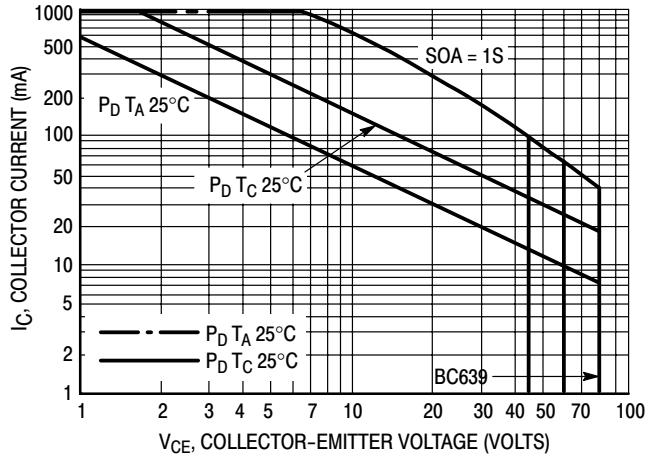


Figure 1. Active Region Safe Operating Area

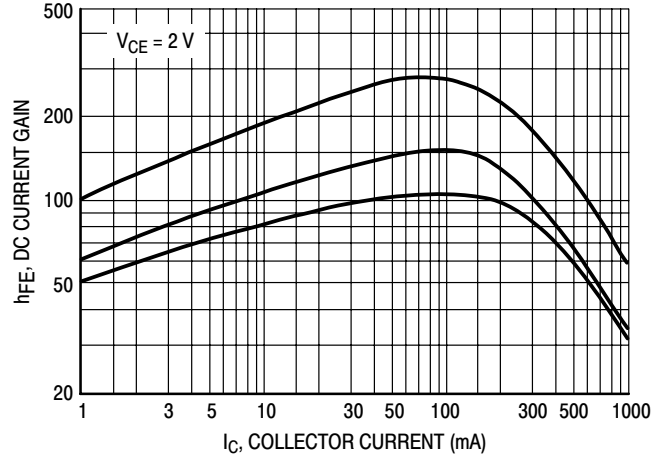


Figure 2. DC Current Gain

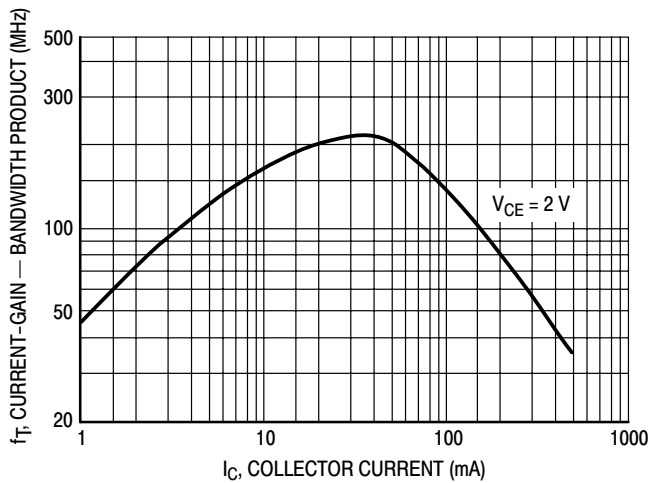


Figure 3. Current-Gain — Bandwidth Product

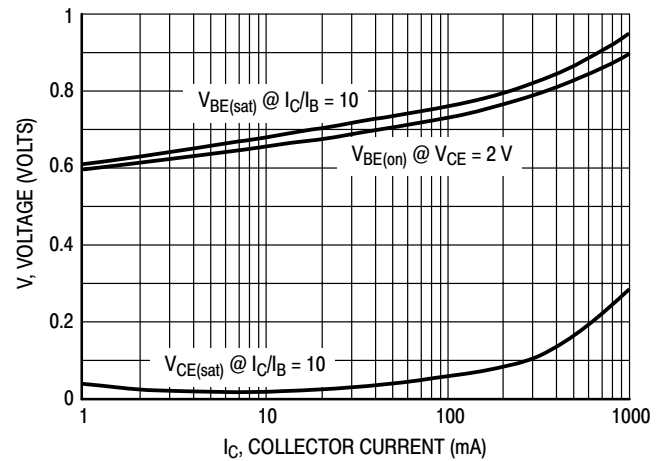


Figure 4. "Saturation" and "On" Voltages

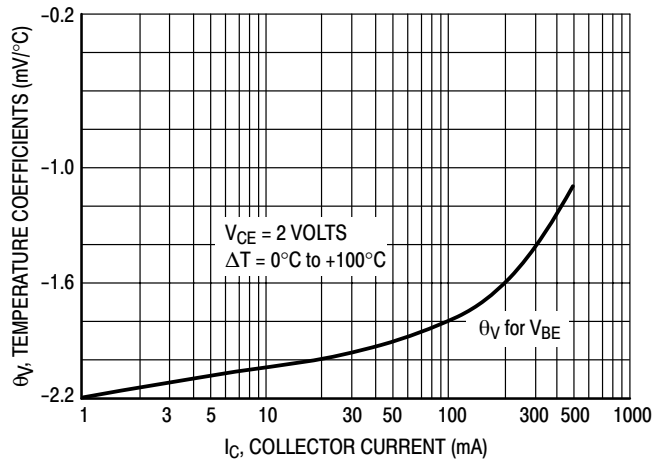
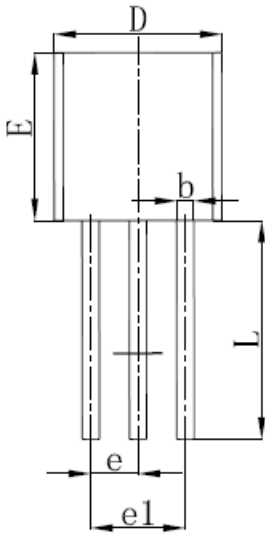
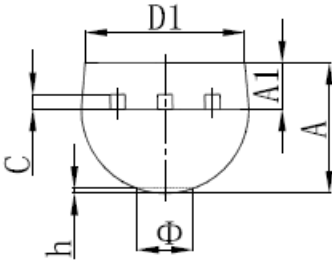
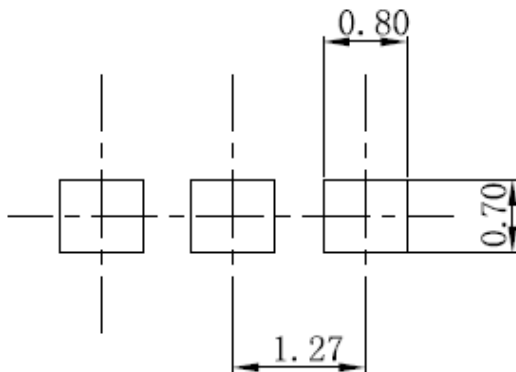


Figure 5. Temperature Coefficients

NPN TRANSISTOR
TO-92 PACKAGE OUTLINE DIMENSIONS


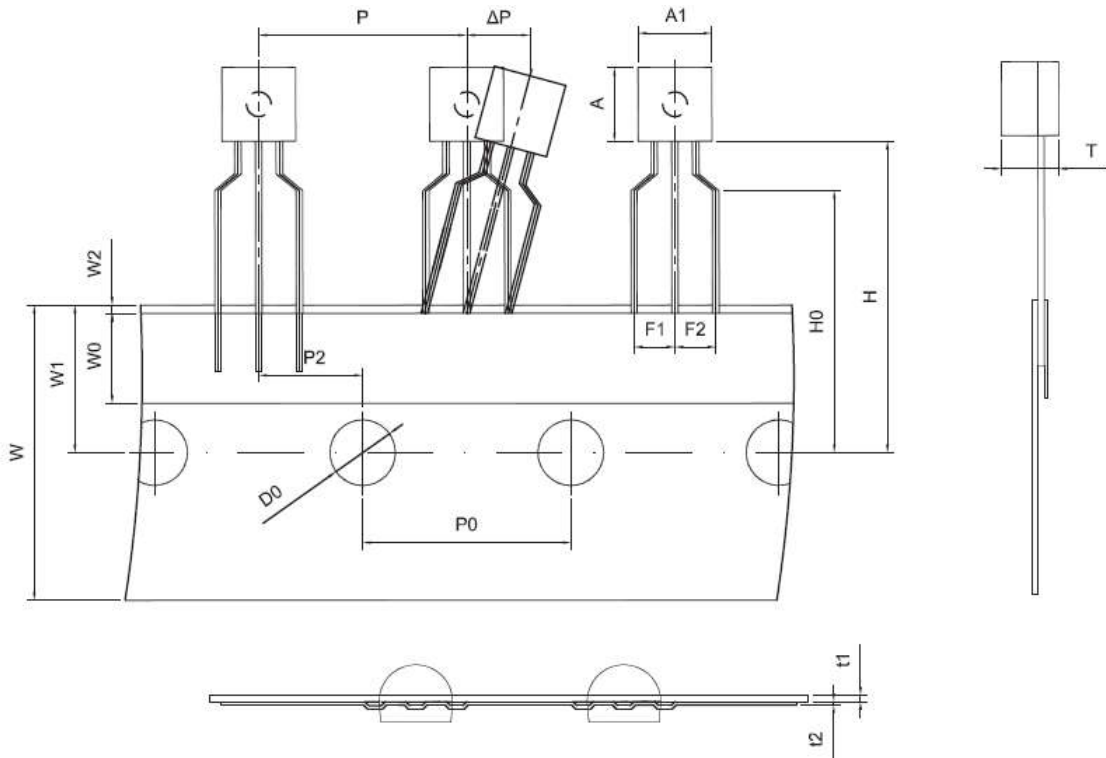
Symbol	Dimensions in millimeters		Dimensions in Inches	
	Min	Max	Min	Max
A	3.300	3.700	0.130	0.146
A1	1.100	1.400	0.043	0.055
b	0.380	0.550	0.015	0.022
c	0.360	0.510	0.014	0.020
D	4.300	4.700	0.169	0.185
D1	3.430		0.135	
E	4.300	4.700	0.169	0.185
e	1.270 TYP		0.050 TYP	
e1	2.440	2.640	0.096	0.104
L	14.100	14.500	0.555	0.571
Φ		1.600		0.063
h	0.000	0.380	0.000	0.015

TO-92 SUGGESTED PAD LAYOUT

Note:

1. Controlling dimension: in millimeters
2. General tolerance: $\pm 0.05\text{mm}$
3. The pad layout is for reference purposes only

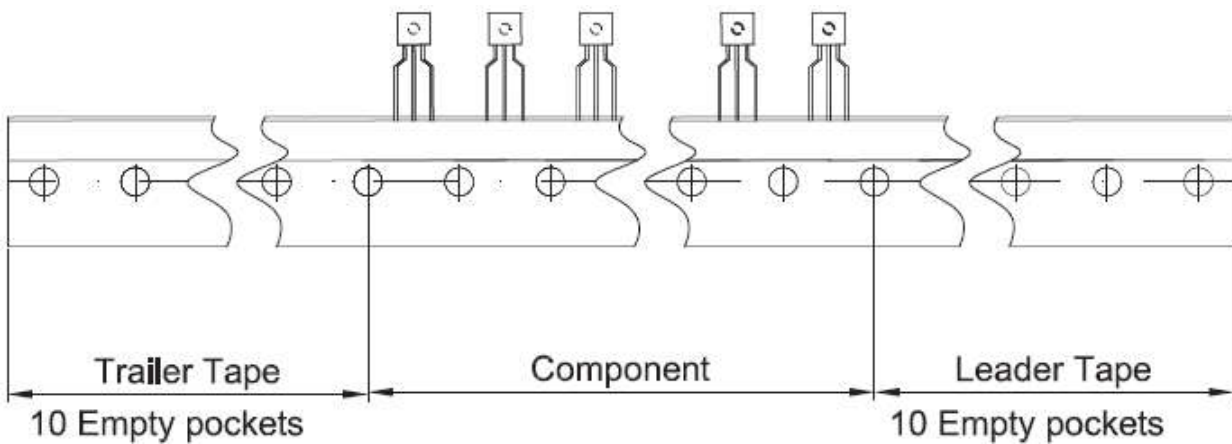
NPN TRANSISTOR

TO-92 TAPE AND REEL



Dimensions are in millimeter								
A1	A	T	P	P0	P2	F1	F2	W
4.5	4.5	3.5	12.7	12.7	6.35	2.5	2.5	18.0
W0	W1	W2	H	H0	D0	t1	t2	ΔP
6.0	9.0	1.0 MAX	19.0	16.0	4.0	0.4	0.2	0

TO-92 PACKAGE TAPING DIMENSION



Package	Box	Box size(mm)	Carton	Carton size(mm)
TO-92	2000pcs	333x162x43	20000pcs	350x340x250