

## WBFBP-03E Plastic-Encapsulate Transistors

### TP857LED03 TRANSISTOR (PNP)

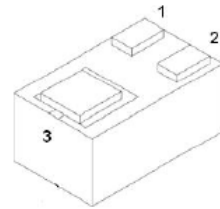
#### FEATURE

- Low Current
- Low Voltage
- Ultra Small SMD Plastic Package
- Complementary to TP847LED03
- For General-purpose Switching and Amplification

#### MARKING: D2



#### WBFBP-03E



1. BASE
2. EMITTER
3. COLLECTOR

#### MAXIMUM RATINGS ( $T_a=25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Value	Unit
$V_{CBO}$	Collector-Base Voltage	-50	V
$V_{CEO}$	Collector-Emitter Voltage	-45	V
$V_{EBO}$	Emitter-Base Voltage	-6	V
$I_C$	Collector Current	-100	mA
$P_C$	Collector Power Dissipation	100	mW
$R_{\theta JA}$	Thermal Resistance from Junction to Ambient	1250	$^\circ\text{C}/\text{W}$
$T_j$	Junction Temperature	150	$^\circ\text{C}$
$T_{stg}$	Storage Temperature	-55~+150	$^\circ\text{C}$

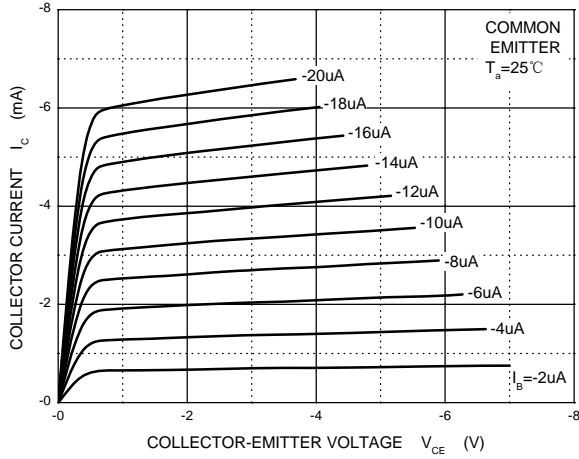
#### ELECTRICAL CHARACTERISTICS ( $T_a=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Test condition	Min	Typ	Max	Unit
Collector-base breakdown voltage	$V_{(BR)CBO}$	$I_C=-10\mu\text{A}, I_E=0$	-50			V
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	$I_C=-10\text{mA}, I_B=0$	-45			V
Emitter-base breakdown voltage	$V_{(BR)EBO}$	$I_E=-10\mu\text{A}, I_C=0$	-6			V
Collector cut-off current	$I_{CBO}$	$V_{CB}=-30\text{V}, I_E=0$			-15	nA
Emitter cut-off current	$I_{EBO}$	$V_{EB}=-5\text{V}, I_C=0$			-15	nA
DC current gain	$h_{FE}^*$	$V_{CE}=-5\text{V}, I_C=-2\text{mA}$	220		475	
Collector-emitter saturation voltage	$V_{CE(sat)1}^*$	$I_C=-10\text{mA}, I_B=-0.5\text{mA}$			-0.2	V
	$V_{CE(sat)2}^*$	$I_C=-100\text{mA}, I_B=-5\text{mA}$			-0.4	V
Base-emitter saturation voltage	$V_{BE(sat)1}^*$	$I_C=-10\text{mA}, I_B=-0.5\text{mA}$		-0.7		V
	$V_{BE(sat)2}^*$	$I_C=-100\text{mA}, I_B=-5\text{mA}$		-0.9		V
Base-emitter voltage	$V_{BE1}^*$	$V_{CE}=-5\text{V}, I_C=-2\text{mA}$			-0.7	V
	$V_{BE2}^*$	$V_{CE}=-5\text{V}, I_C=-10\text{mA}$			-0.77	V
Transition frequency	$f_T$	$V_{CE}=-5\text{V}, I_C=-10\text{mA}, f=100\text{MHz}$	100			MHz
Collector output capacitance	$C_{ob}$	$V_{CB}=-10\text{V}, I_E=0, f=1\text{MHz}$		2.5		pF
Noise figure	NF	$V_{CE}=-5\text{V}, I_E=-0.2\text{mA}, f=1\text{kHz}, R_S=1\text{k}\Omega, B=200\text{Hz}$		10		dB

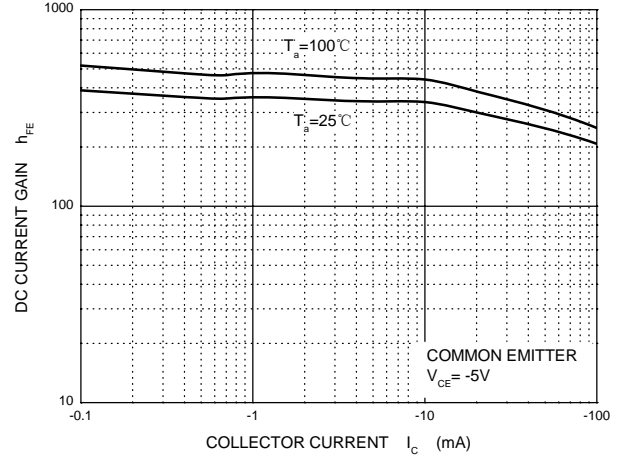
\*Pulse test: pulse width  $\leq 300\mu\text{s}$ , duty cycles  $\leq 2.0\%$ .

# Typical Characteristics

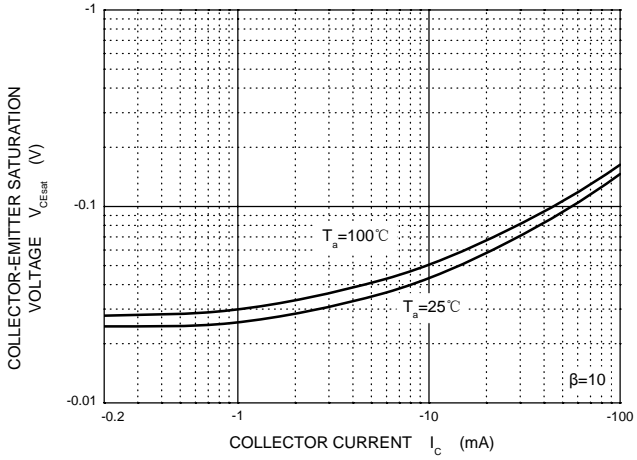
Static Characteristic



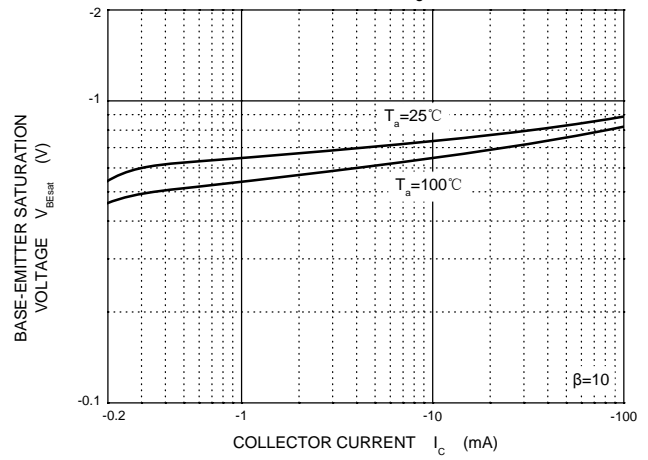
$h_{FE}$  —  $I_c$



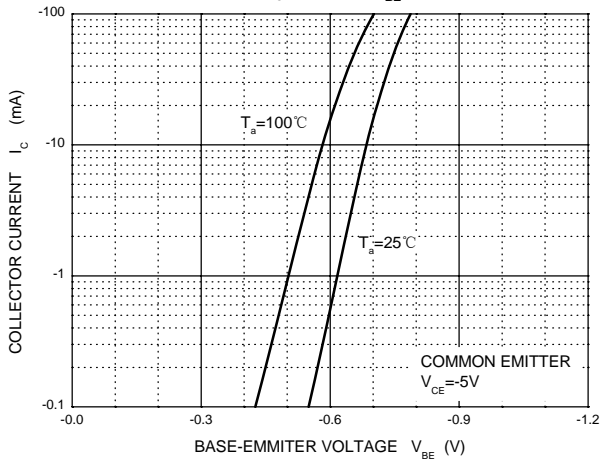
$V_{CEsat}$  —  $I_c$



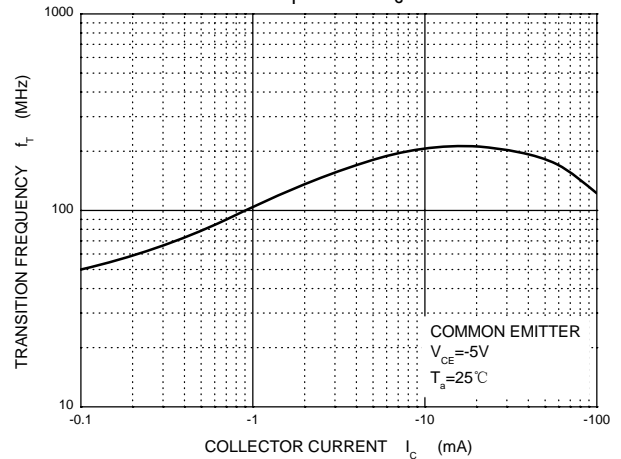
$V_{BEsat}$  —  $I_c$



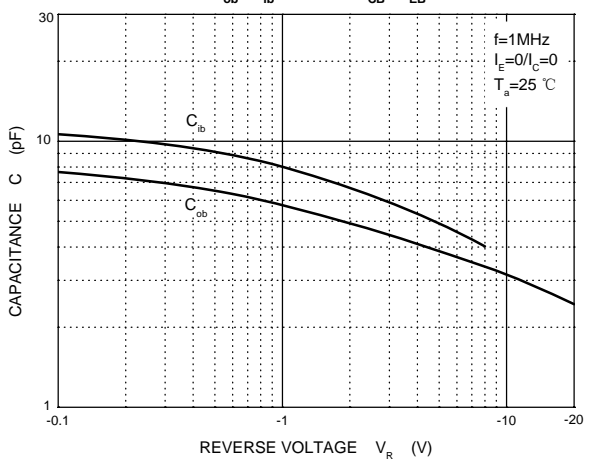
$I_c$  —  $V_{BE}$



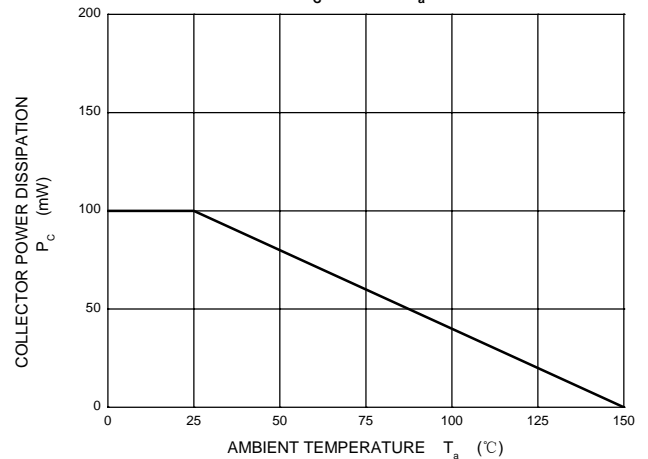
$f_T$  —  $I_c$



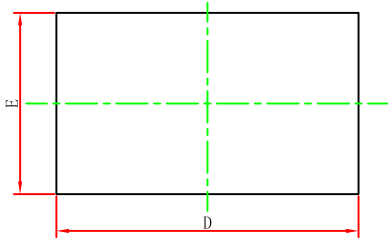
$C_{ob}/C_{ib}$  —  $V_{CB}/V_{EB}$



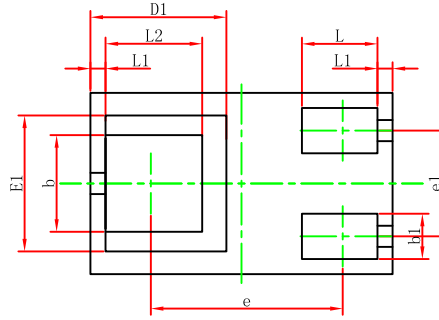
$P_c$  —  $T_a$



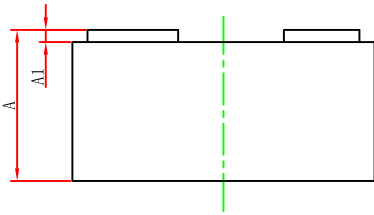
## WBFBP-03E Package Outline Dimensions



TOP VIEW



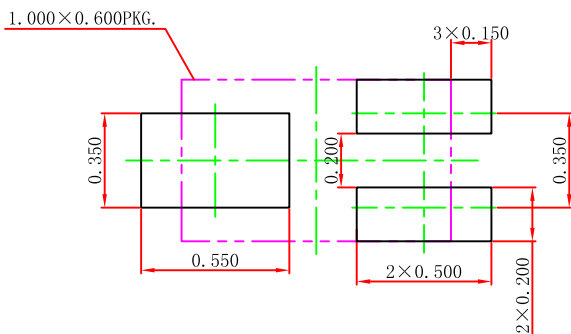
BOTTOM VIEW



SIDE VIEW

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.450	0.550	0.018	0.022
A1	0.010	0.100	0.000	0.004
D	0.950	1.050	0.037	0.041
E	0.550	0.650	0.022	0.026
D1	0.450REF.		0.018REF.	
E1	0.450REF.		0.018REF.	
b	0.270	0.370	0.011	0.015
b1	0.100	0.200	0.004	0.008
e	0.635REF.		0.025REF.	
e1	0.300	0.400	0.012	0.016
L	0.200	0.300	0.008	0.012
L1	0.050REF.		0.002REF.	
L2	0.270	0.370	0.011	0.015

## WBFBP-03E Suggested Pad Layout



**Note:**

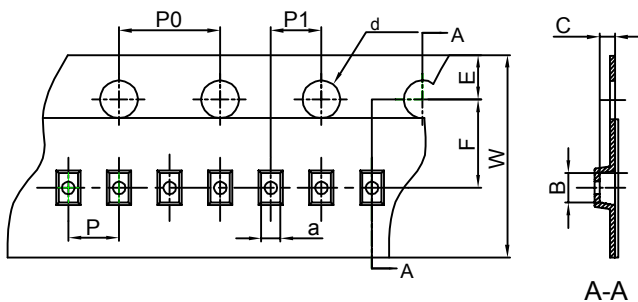
1. Controlling dimension: in millimeters.
2. General tolerance:  $\pm 0.050\text{mm}$ .
3. The pad layout is for reference purposes only.

**NOTICE**

JCET reserve the right to make modifications, enhancements, improvements, corrections or other changes without further notice to any product herein. JCET does not assume any liability arising out of the application or use of any product described herein.

## WBFBP-03E(1.0×0.6×0.5) Tape and Reel

### WBFBP-03E(1.0×0.6×0.5) Embossed Carrier Tape

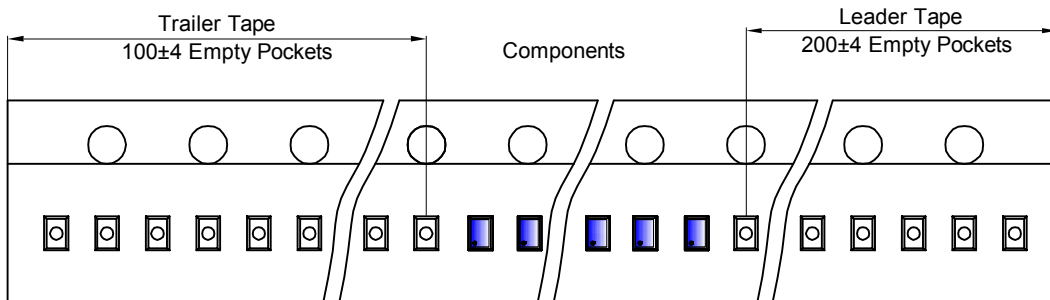


#### Packaging Description:

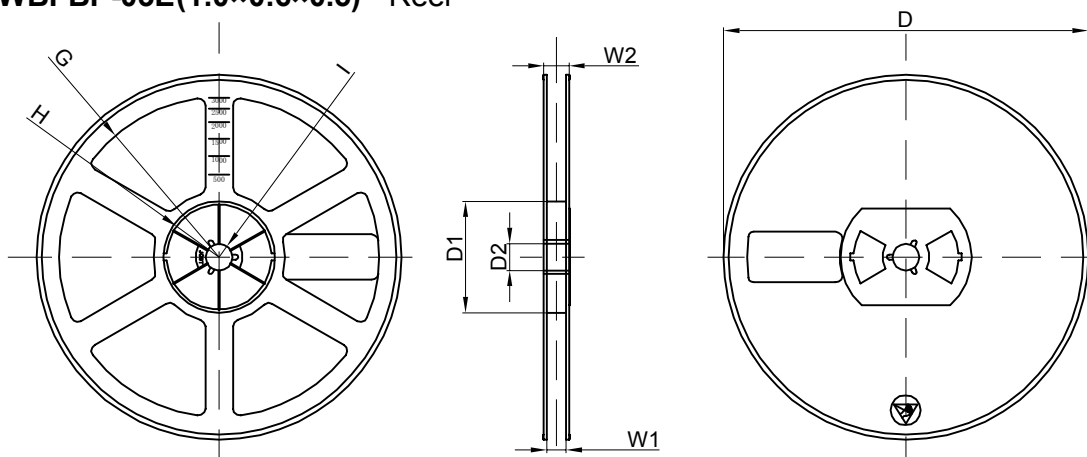
**WBFBP-03E(1.0×0.6×0.5)** parts are shipped in tape. The carrier tape is made from a dissipative (carbon filled) polycarbonate resin. The cover tape is a multilayer film (Heat Activated Adhesive in nature) primarily composed of polyester film, adhesive layer, sealant, and anti-static sprayed agent. These reeled parts in standard option are shipped with 10,000 units per 7" or 17.8cm diameter reel. The reels are clear in color and is made of polystyrene plastic (anti-static coated).

Dimensions are in millimeter										
Pkg type	a	B	C	d	E	F	P0	P	P1	W
<b>WBFBP-03E(1.0×0.6×0.5)</b>	0.66	1.15	0.66	Ø1.50	1.75	3.50	4.00	2.00	2.00	8.00

### WBFBP-03E(1.0×0.6×0.5) Tape Leader and Trailer



### WBFBP-03E(1.0×0.6×0.5) Reel



Dimensions are in millimeter								
Reel Option	D	D1	D2	G	H	I	W1	W2
7" Dia	Ø178.00	54.40	13.00	R78.00	R25.60	R6.50	9.50	12.30

REEL	Reel Size	Box	Box Size(mm)	Carton	Carton Size(mm)	G.W.(kg)
10000 pcs	7 inch	150,000 pcs	203×203×195	600,000 pcs	438×438×220	