

**WBFBP-03E Plastic-Encapsulate Transistors****TK3904LED03 TRANSISTOR (NPN)****DESCRIPTION**

- NPN single switching transistor ultra small SMD plastic package

FEATURE

- Complementary to TK3906LED03
- Single General-Purpose Switching Transistor

APPLICATION

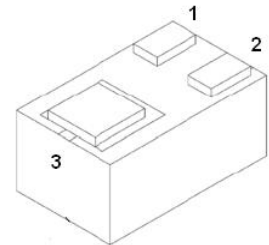
- General-Purpose Switching and Amplification

MARKING: 1N**TOP VIEW****MAXIMUM RATINGS (T_a=25°C unless otherwise noted)**

Symbol	Parameter	Value	Unit	
V _{CBO}	Collector-Base Voltage	60	V	
V _{CEO}	Collector-Emitter Voltage	40	V	
V _{EBO}	Emitter-Base Voltage	6	V	
I _C	Collector Current -Continuous	200	mA	
P _C	Collector Dissipation	Note1	100	mW
		Note2	590	mW
R _{θJA}	Thermal Resistance from Junction to Ambient	Note1	1250	°C/W
		Note2	212	°C/W
T _J ,T _{stg}	Operation Junction and Storage Temperature Range	-55~+150	°C	

Note:1. Device mounted on an FR4 PCB, single-sided copper, tin-plated and standard footprint.

2.Device mounted on an FR4 PCB, single-sided copper, tin-plated, mounting pad for collector1cm².

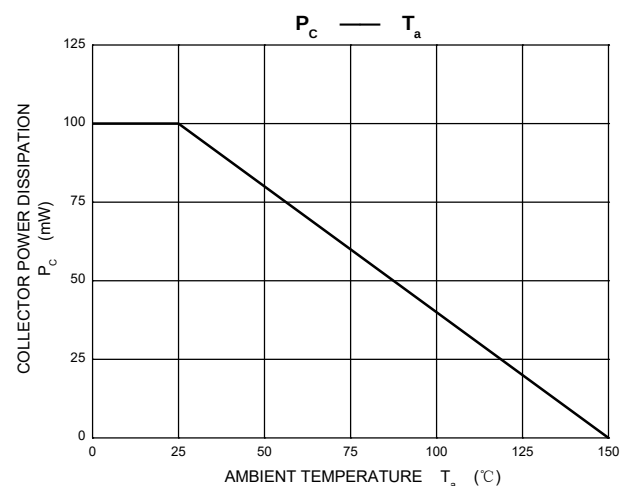
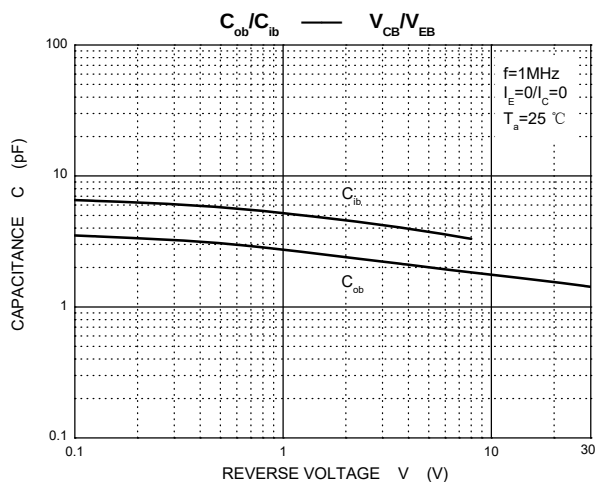
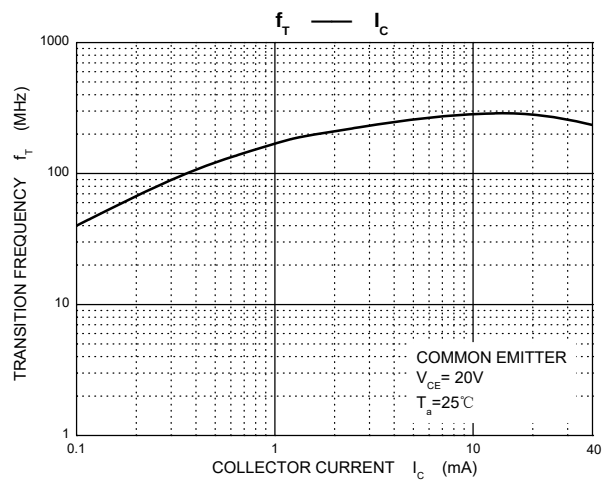
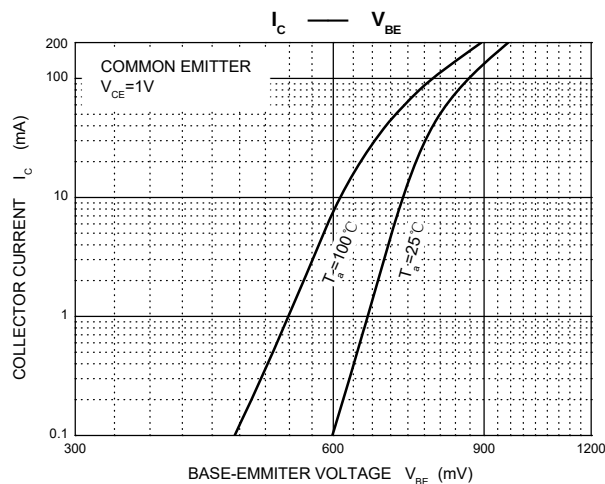
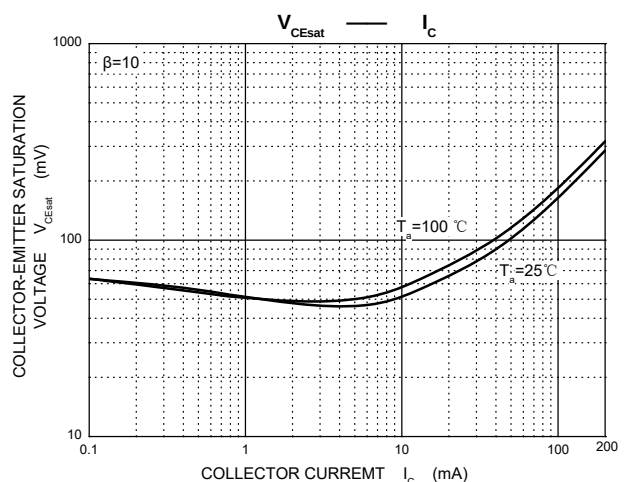
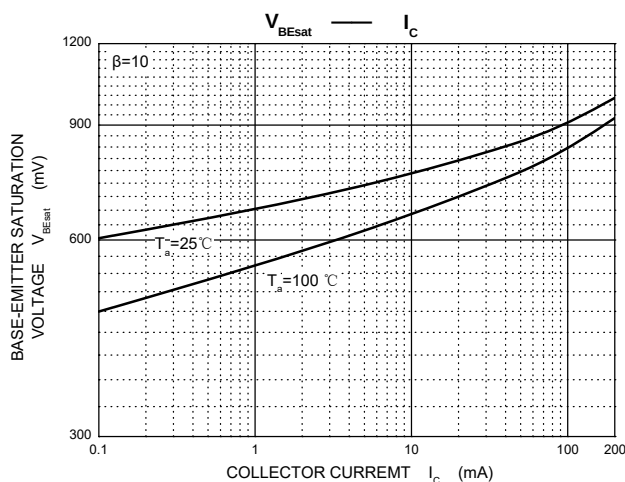
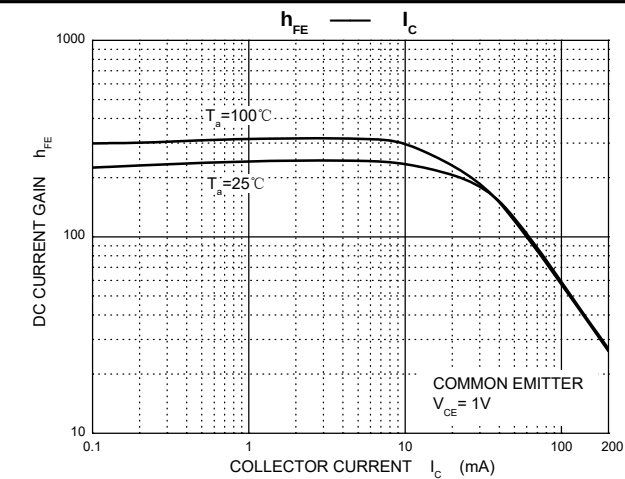
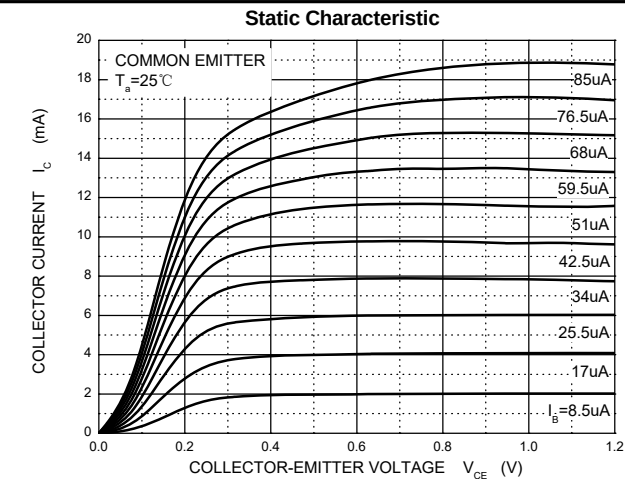
WBFBP-03E

1. BASE
2. EMITTER
3. COLLECTOR

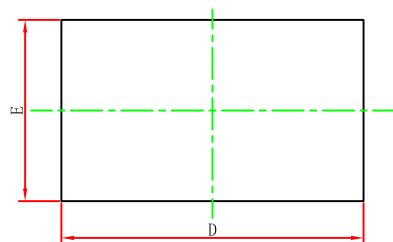
ELECTRICAL CHARACTERISTICS (Ta=25°C unless otherwise specified)

Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Collector-base breakdown voltage	$V_{(BR)CBO}$	$I_C = 10\mu A, I_E = 0$	60			V
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	$I_C = 1mA, I_B = 0$	40			V
Emitter-base breakdown voltage	$V_{(BR)EBO}$	$I_E = 10\mu A, I_C = 0$	6			V
Collector cut-off current	I_{CBO}	$V_{CB} = 60V, I_E = 0$			0.1	μA
Collector cut-off current	I_{CEX}	$V_{CE} = 30V, V_{BE(off)} = 3V$			50	nA
Emitter cut-off current	I_{EBO}	$V_{EB} = 5V, I_C = 0$			0.1	μA
DC current gain	h_{FE}	$V_{CE} = 1V, I_C = 10mA$	100		300	
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C = 50mA, I_B = 5mA$			0.3	V
Base-emitter saturation voltage	$V_{BE(sat)}$	$I_C = 50mA, I_B = 5mA$			0.95	V
Transition frequency	f_T	$V_{CE} = 20V, I_C = 10mA, f = 100MHz$	300			MHz
Delay time	t_d	$V_{CC} = 3V, V_{BE(off)} = 0.5V,$ $I_C = 10mA, I_{B1} = 1mA$			35	ns
Rise time	t_r				35	ns
Storage time	t_s				200	ns
Fall time	t_f				50	ns

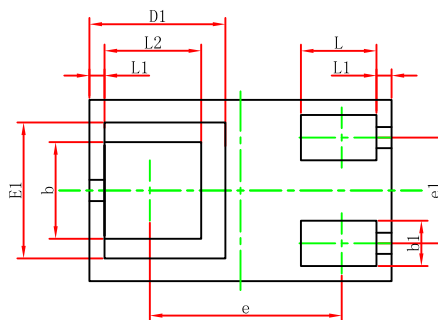
Typical Characteristics



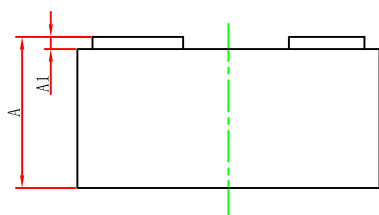
WBFBP-03E Package Outline Dimensions



TOP VIEW



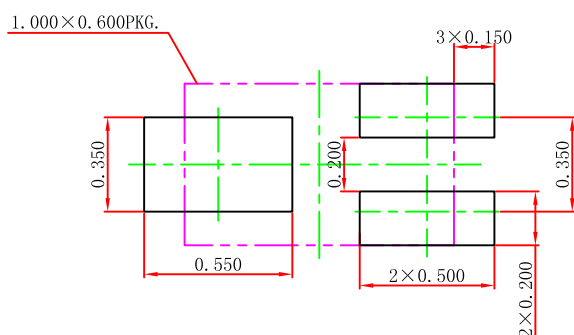
BOTTOM VIEW



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:

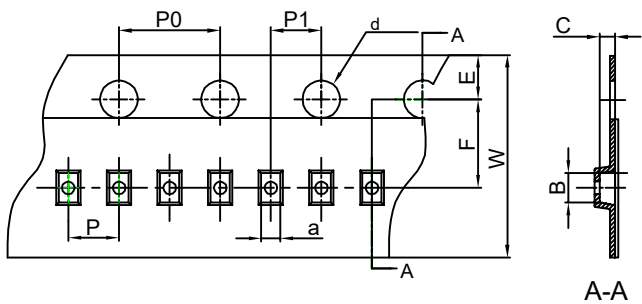
1. Controlling dimension: in millimeters.
2. General tolerance: $\pm 0.050\text{mm}$.
3. The pad layout is for reference purposes only.

NOTICE

JSCJ reserves the right to make modifications, enhancements, improvements, corrections or other changes without further notice to any product herein. JSCJ 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

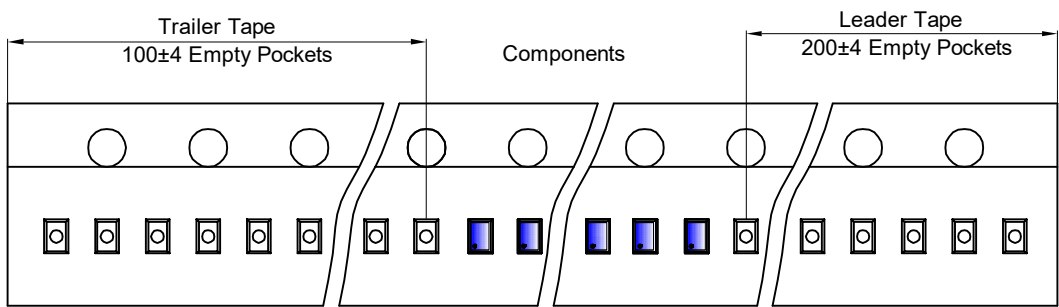
WBFBP-03E(1.0×0.6×0.5) Embossed Carrier Tape



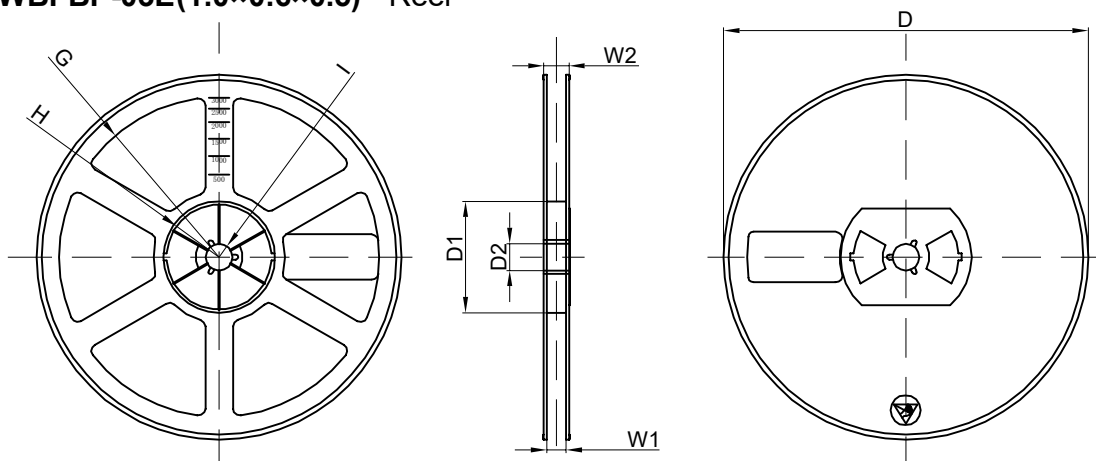
Packaging Description:
WBFBP-03E(1.0×0.6×0.5) parts are shipped in tape. The carrier tape is made from a dissipative (carbon filled) polycarbonate resin. The cover tape is a multilayer film (Heat Activated Adhesive in nature) primarily composed of polyester film, adhesive layer, sealant, and anti-static 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
WBFBP-03E(1.0×0.6×0.5)	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	