

RoHS Compliant Product
A suffix of "-C" specifies halogen and lead free

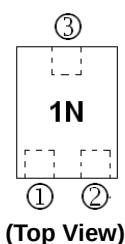
FEATURES

- Collector current capability $I_C=200\text{mA}$
- Collector-emitter voltage $V_{CEO}=40\text{V}$.

APPLICATION

- General switching and amplification.

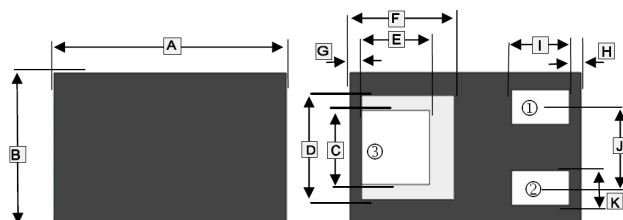
MARKING



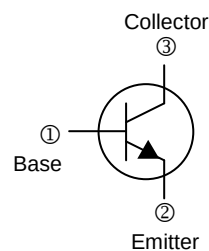
PACKAGING DIMENSION

Package	MPQ	Leader Size
WBFBP03E	10K	7 inch

WBFBP-03E



REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	0.95	1.05	H	0.50REF	
B	0.55	0.65	I	0.20	0.30
C	0.27	0.37	J	0.30	0.40
D	0.45REF.		K	0.10	0.20
E	0.27	0.37	L	0.01	0.10
F	0.45REF.		M	0.45	0.55
G	0.50REF.				



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

Parameters	Symbol	Rating	Unit
Collector - Emitter Voltage	V_{CEO}	40	V
Collector - Base Voltage	V_{CBO}	60	V
Emitter - Base Voltage	V_{EBO}	6	V
Collector Current - Continuous	I_C	200	mA
Total Device Dissipation	P_D^1	100	mW
	P_D^2	590	mW
Thermal Resistance, Junction to Ambient ¹	$R_{\theta JA}^1$	1250	$^\circ\text{C} / \text{W}$
	$R_{\theta JA}^2$	212	$^\circ\text{C} / \text{W}$
Junction, Storage Temperature	T_J, T_{STG}	150, -55 ~ +150	$^\circ\text{C}$

NOTE:

- Device mounted on an FR4 PCB, single-sided copper, tin-plated and standard footprint
- Device mounted on an FR4 PCB, single-sided copper, tin-plated, mounting pad for collector 1cm^2

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

Parameters	Symbol	MIN.	MAX.	Unit	TEST CONDITIONS
OFF CHARACTERISTICS					
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	60	-	V	$I_C=10\mu\text{A}$, $I_E=0$
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	40	-	V	$I_C=1\text{mA}$, $I_B=0$
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	6	-	V	$I_E=10\mu\text{A}$, $I_C=0$
Collector cut-off current	I_{CBO}	-	0.1	μA	$V_{CB}=60\text{V}$, $I_E=0$
Collector Cut-Off Current	I_{CEX}	-	50	nA	$V_{CE}=30\text{V}$, $V_{BE(OFF)}=3\text{V}$
Emitter cut-off current	I_{EBO}	-	0.1	μA	$V_{EB}=5\text{V}$, $I_C=0$
DC current gain	$h_{FE(2)}$	100	300		$I_C=10\text{mA}$, $V_{CE}=1\text{V}$
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	-	0.3	V	$I_C=50\text{mA}$, $I_B=5\text{mA}$
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	-	0.95	V	$I_C=50\text{mA}$, $I_B=5\text{mA}$
Current-Gain-Bandwidth Product	f_T	300	-	MHz	$I_C=10\text{mA}$, $V_{CE}=20\text{V}$, $f=100\text{MHz}$
Delay Time	t_d	-	35	nS	$V_{CC}=3\text{V}$, $V_{BE}=-0.5\text{V}$, $I_C=10\text{mA}$, $I_{B1}=1\text{mA}$
Rise Time	t_r	-	35	nS	
Storage Time	t_s	-	200	nS	$V_{CC}=3\text{V}$, $I_C=10\text{mA}$ $I_{B1}=I_{B2}=1\text{mA}$
Fall Time	t_f	-	50	nS	