



WBFBP-03B Plastic-Encapsulate Transistors

TRANSISTOR

DESCRIPTION

NPN Epitaxial Silicon Transistor

FEATURES

Epitaxial Planar Die Construction
Complementary PNP Type Available (TK3906NND03)
Ultra-Small Surface Mount Package
Also Available in Lead Free Version

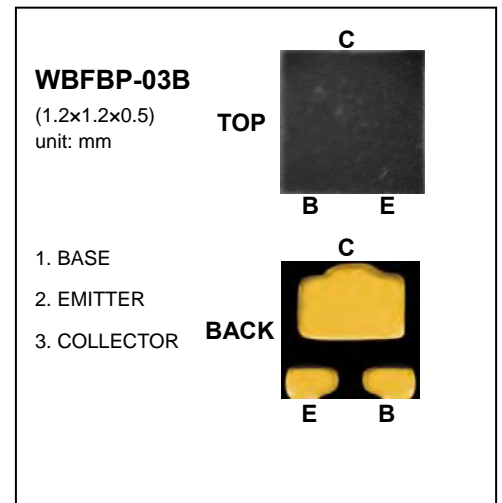
APPLICATION

General Purpose Amplifier, switching
For portable equipment:(i.e. Mobile phone,MP3, MD,CD-ROM, DVD-ROM, Note book PC, etc.)

Pb-Free package is available

RoHS product for packing code suffix "G"

Halogen free product for packing code suffix "H"



MARKING:1N



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	0.2	A
P _C	Collector Dissipation	0.15	W
T _J	Junction Temperature	150	°C
T _{stg}	Storage Temperature	-55~150	°C

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

Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Collector-base breakdown voltage	V _{(BR)CBO}	I _C =10μA, 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 =10μA, I _C =0	6			V
Collector cut-off current	I _{CEX}	V _{CE} =30V, V _{EB(off)} =3V			0.05	μA
Emitter cut-off current	I _{EBO}	V _{EB} =5V, I _C =0			0.1	μA
DC current gain	h _{FE(1)}	V _{CE} =1V, I _C =0.1mA	40			
	h _{FE(2)}	V _{CE} =1V, I _C =1mA	70			
	h _{FE(3)}	V _{CE} =1V, I _C =10mA	100		300	
	h _{FE(4)}	V _{CE} =1V, I _C =50mA	60			
	h _{FE(5)}	V _{CE} =1V, I _C =100mA	30			
Collector-emitter saturation voltage	V _{CE(sat)1}	I _C =10mA, I _B =1mA			0.2	V
	V _{CE(sat)2}	I _C =50mA, I _B =5mA			0.3	V
Base-emitter saturation voltage	V _{BE(sat)1}	I _C =10mA, I _B =1mA	0.65		0.85	V
	V _{BE(sat)2}	I _C =50mA, I _B =5mA			0.95	V
Transition frequency	f _T	V _{CE} =20V, I _C =10mA, f=100MHz	300			MHz



WILLAS



TK3904NND03

WBFBP-03B Plastic-Encapsulate Transistors

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

Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Collector output capacitance	C_{ob}	$V_{CB}=5\text{V}, I_E=0, f=1\text{MHz}$			4	pF
Noise figure	NF	$V_{CE}=5\text{V}, I_c=0.1\text{mA}$,			5	dB
Delay time	t_d	$V_{CC}=3\text{V}, V_{BE(off)}=-0.5\text{V}$,			35	ns
Rise time	t_r	$I_c=10\text{mA}, I_{B1}=1\text{mA}$			35	ns
Storage time	t_s	$V_{CC}=3\text{V}, I_c=10\text{mA}$			200	ns
Fall time	t_f	$I_{B1}=I_{B2}=1\text{mA}$			50	ns

Preliminary