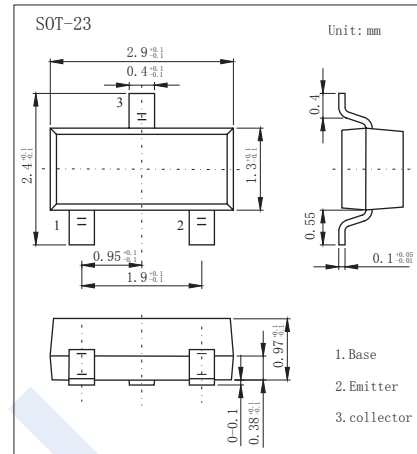


NPN Transistors

BCW31~BCW33 (KCW31~KCW33)

■ Features

- Low current (100 mA)
- Low voltage (32 V).
- PNP complements: BCW29 and BCW30.

■ Absolute Maximum Ratings $T_a = 25^\circ\text{C}$

Parameter	Symbol	Rating	Unit
Collector - Base Voltage	V_{CB0}	32	V
Collector - Emitter Voltage	V_{CE0}	32	
Emitter - Base Voltage	V_{EB0}	5	
Collector Current - Continuous	I_C	100	mA
Peak Collector Current	I_{CM}	200	
Peak Base Current	I_{BM}	200	
Collector Power Dissipation	P_C	250	mW
Thermal Resistance From Junction to Ambient (Note.1)	R_{thja}	500	K/W
Junction Temperature	T_J	150	$^\circ\text{C}$
Storage Temperature Range	T_{stg}	-55 to 150	

Note. 1: Transistor mounted on an FR4 printed-circuit.

NPN Transistors

BCW31~BCW33 (KCW31~KCW33)

■ Electrical Characteristics Ta = 25°C

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Collector- base breakdown voltage	V _{CBO}	I _c = 100 μA, I _E = 0	32			V
Collector- emitter breakdown voltage	V _{CEO}	I _c = 2 mA, I _B = 0	32			
Emitter - base breakdown voltage	V _{EBO}	I _E = 100 μA, I _c = 0	5			
Collector-base cut-off current	I _{CBO}	V _{CB} = 32 V, I _E = 0			100	nA
		V _{CB} = 32 V, I _E = 0, T _J =100°C			10	μA
Emitter cut-off current	I _{EBO}	V _{EB} = 5V, I _c =0			100	nA
Collector-emitter saturation voltage	V _{CE(sat)}	I _c =10 mA, I _B =0.5mA		120	250	mV
		I _c =50 mA, I _B =2.5mA		210		
Base - emitter saturation voltage	V _{BE(sat)}	I _c =10 mA, I _B =0.5mA		750		
		I _c =50 mA, I _B =2.5mA		850		
Base - emitter voltage	V _{BE}	V _{CE} = 5V, I _c = 2mA	550		700	
DC current gain	BCW31 BCW32 BCW33	h _{FE}	V _{CE} = 5V, I _c = 10μA		90	
					150	
					270	
DC current gain	BCW31 BCW32 BCW33	h _{FE}	V _{CE} = 5V, I _c = 2mA	110		220
				200		450
				420		800
Collector output capacitance	C _c	V _{CB} = 10V, I _E =I _c =0, f=10MHz		2.5		pF
Noise figure	NF	I _c = 200 μA; V _{CE} = 5 V; R _s = 2kΩ; f = 1 kHz; B = 200 Hz			10	dB
Transition frequency	f _T	V _{CE} = 5V, I _c = 10mA, f=100MHz	100			MHz

■ Classification of h_{FE}(2)

Type	BCW31	BCW32	BCW33
Range	110-220	200-450	420-800
Marking	D1*	D2*	D3*