

Subject	Paper No and Name	Unit No and Name	Chapter No and Name
Physics	PH 301 Physics of Materials and Electronics	II Electronics	4. Bipolar Junction Transistor (ANIMATION Story Lines)

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Date of Submission	September 22, 2010	
Date of Second submission (pl add if any more)		

Animation**Depletion regions in BJT (n-p-n)**

- #1. Flash the heading "**n-p-n BJT**"
- #2. Flash "**heavily doped n region (for EMITTER)**" and then show the colored box:

n-p-n BJT

heavily doped n region
(for EMITTER)



- #3. Flash "**moderately doped n region (for COLLECFTOR)**" and then add the next colored box:

n-p-n BJT

heavily doped n region
(for EMITTER)

moderately doped n region
(for COLLECTOR)



- #4. Flash "**lightly doped p region (for BASE)**" and then add the blue box in between:

n-p-n BJT

heavily doped n region
(for EMITTER)

lightly doped p region
(for BASE)

moderately doped n region
(for COLLECTOR)



- #5. Join first two blocks like:



#6. Make a moving region (YELLOW) to appear spreading little towards LEFT and more towards RIGHT, like:



Junction
(Emitter-base)

Junction
(Emitter-base)

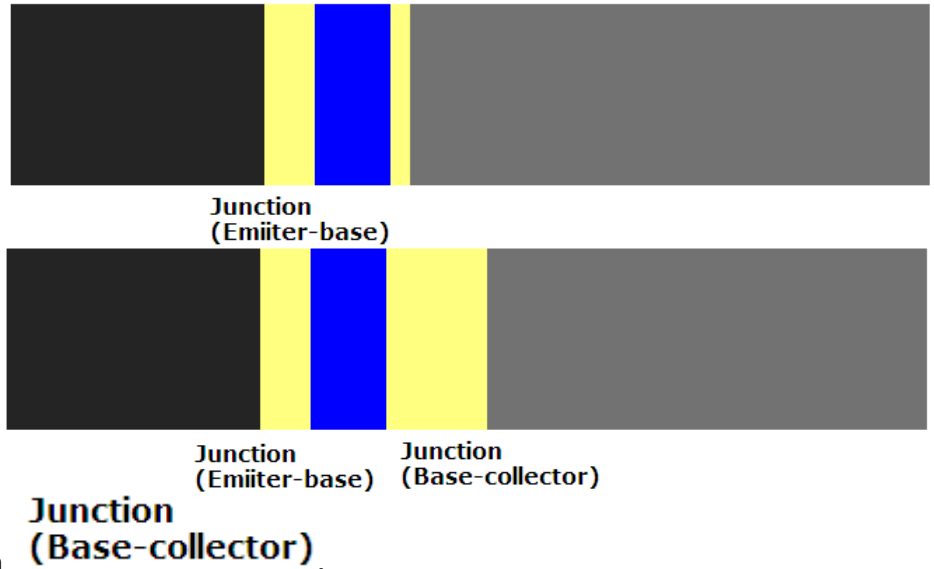
#7. Flash

#8. Now Join the left gap:



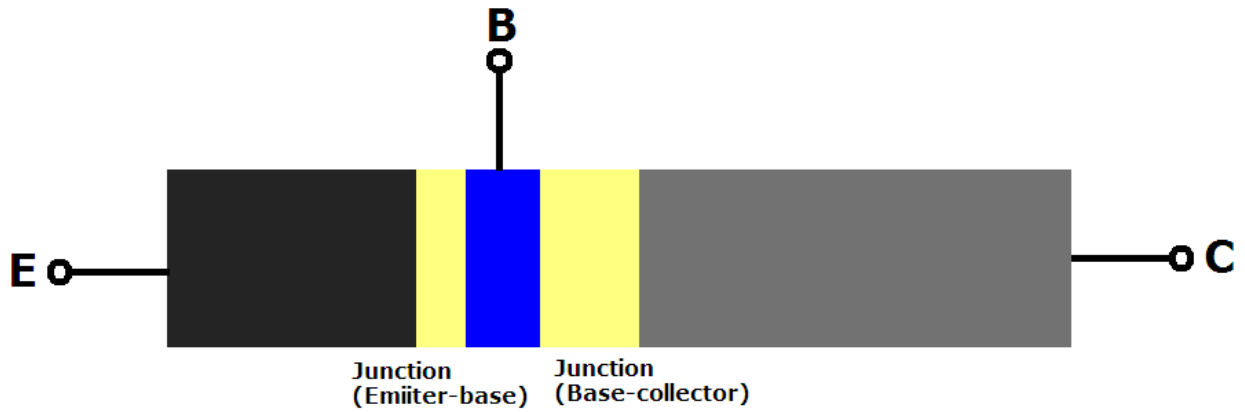
Junction
(Emitter-base)

#9. For this also, make a moving region (YELLOW) to appear spreading little towards LEFT and more towards RIGHT, like:



- #10. Flash
- #11. Make the terminals to appear:

n-p-n BJT



Emitter-base junction width is smaller than that for Base-collector

- #12. Flash the line below the final figure: "**Emitter-base junction width is smaller than that for Base-collector.**"
- #13. Flash the line "**Donor ions in n-regions**" and then put " ● DOTs in the position specified.

n-p-n BJT

• Donor Ions in n-region

Junction (Emitter-base) Junction (Base-collector)

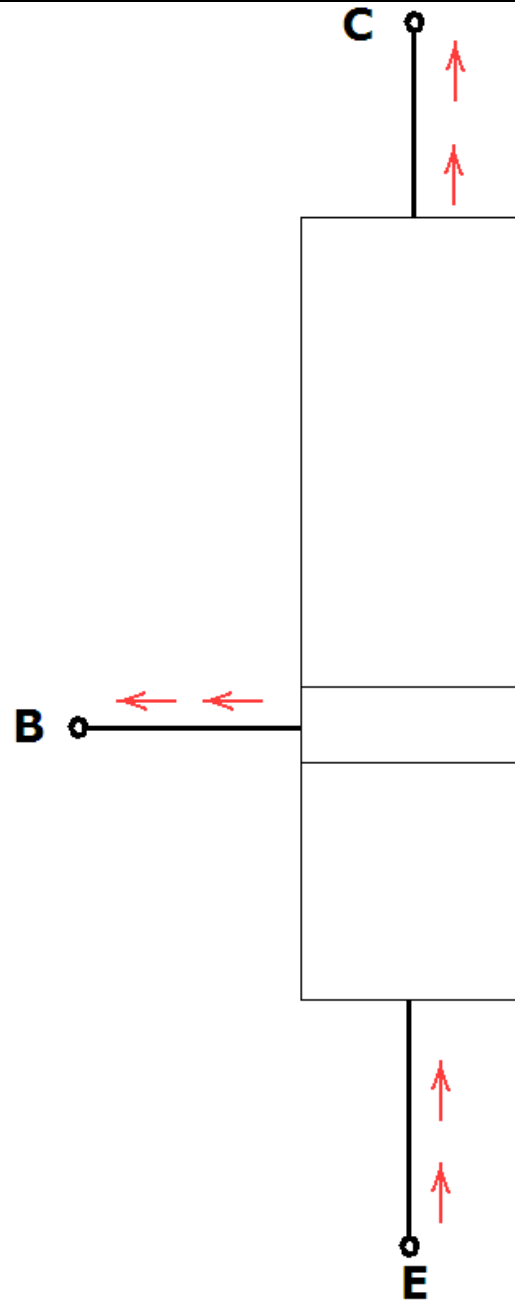
Emitter-base junction width is smaller than that for Base-collector

#14. Flash the line "**Acceptor ions in p-region**" and then put "•" DOTs in the position specified.

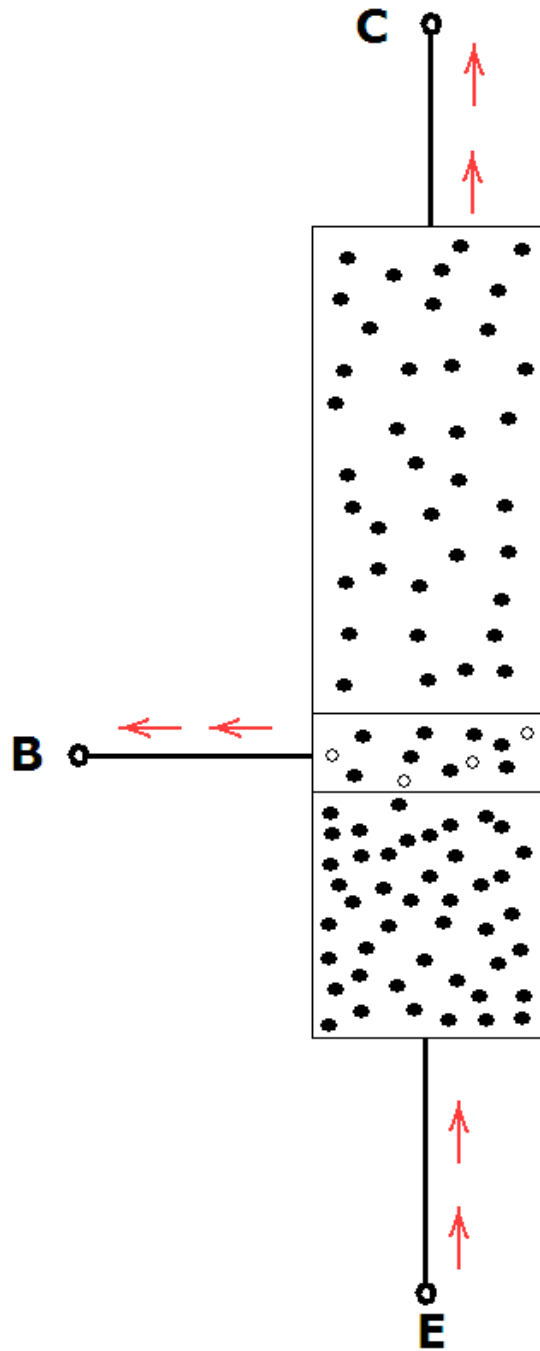
Animation

Electron flow in n-p-n transistor

- #1. *This animation is based on figure 4.7.*
- #2. Make the diagram as shown, with moving RED arrows (←)



- #3. Introduce movable DOTS "●" and "○" (with a random distribution). Note that "○" only appear in **B** region.
- #4. Dark DOT ● should move from bottom to top CONTINUOUSLY, while Hollow DOT ○ should come from left side of B region and go towards right.



#5. When Hollow DOT ○ meets dark DOT ● in the B region they should disappear.

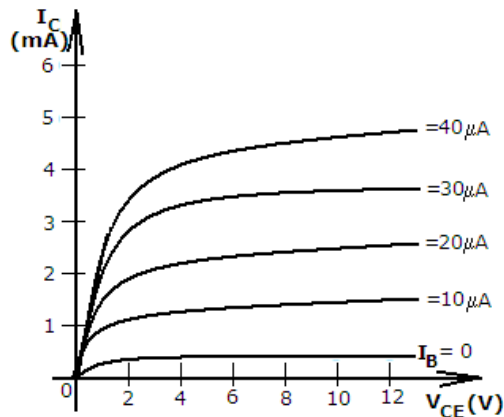
Animation

Typical output characteristics of p-n-p transistor in CE configuration.

#1. This animation is based on figure 4.18.

#2. Make three buttons. (**Cut-off region**, **Saturation region**, **Active region**). On click of these we animation should show the current voltage characteristics.

Typical output characteristics of p-n-p transistor in CE configuration

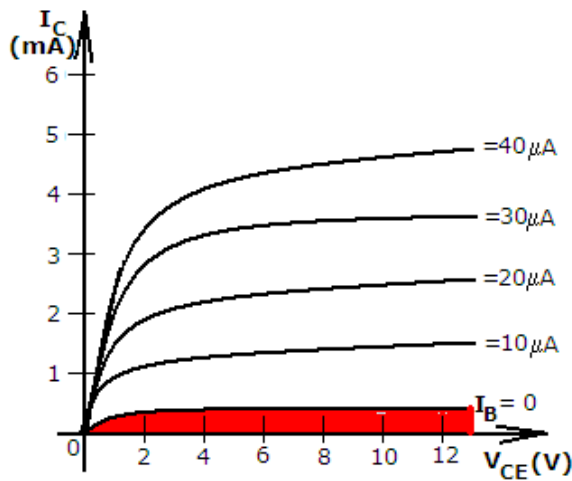


Cut-off Region

Saturation Region

Active Region

#3. On every one individual click, colourize the respective region.



Cut-off Region

