

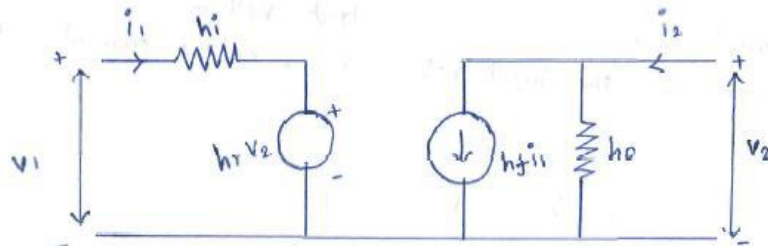


Topic 2.2 : Transistor Hybrid model

$$\textcircled{1} \Rightarrow V_1 = h_i i_1 + h_r V_2 \quad \text{--- (1)}$$

$$\textcircled{2} \Rightarrow i_2 = h_f i_1 + h_o V_2 \quad \text{--- (2)}$$

* For this equation we want to draw equivalent circuit & it verify using KVL to input, KCL to output node.



H-parameter for all the 3 configurations

Parameters	CE	CB	CC
Input resistance (h_{ii})	h_{ie}	h_{ib}	h_{ic}
Reverse Voltage gain	h_{re}	h_{rb}	h_{rc}
Forward Transfer current gain	h_{fe}	h_{fb}	h_{fc}
Output admittance	h_{oe}	h_{ob}	h_{oc}



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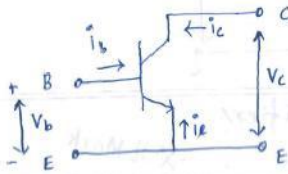


W.K.T

$$V_1 = h_{11} i_1 + h_{12} V_2 \quad \text{--- (1)}$$

$$i_2 = h_{21} i_1 + h_{22} V_2 \quad \text{--- (2)}$$

For CE Configuration :

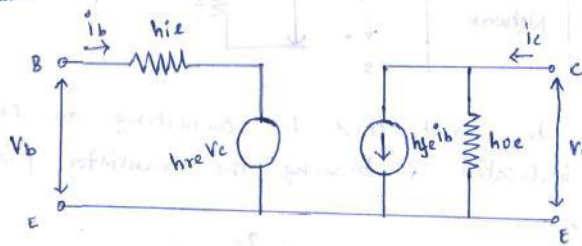


① \Rightarrow can be modified based on CE

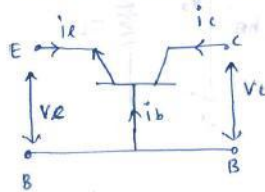
$$V_b = h_{ie} i_b + h_{re} V_c \quad \text{--- (3)}$$

$$i_c = h_{fe} i_b + h_{oe} V_c \quad \text{--- (4)}$$

For eqn (3) & (4) we have to draw the small signal equivalent circuit.



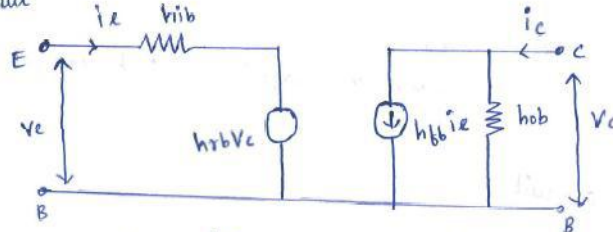
For CB configuration



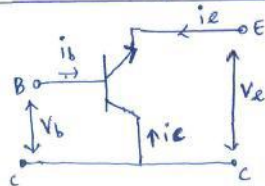
$$\text{①} \Rightarrow V_e = h_{ib} i_e + h_{rb} V_c \quad \text{--- (5)}$$

$$\text{②} \Rightarrow i_c = h_{fb} i_e + h_{ob} V_c \quad \text{--- (6)}$$

For eqn (5) & (6) we have to draw the small signal equivalent circuit.



For CC configuration



$$\text{①} \Rightarrow V_b = h_{ic} i_b + h_{rc} V_e \quad \text{--- (7)}$$

$$\text{②} \Rightarrow i_e = h_{fc} i_b + h_{oc} V_e \quad \text{--- (8)}$$

③



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For eqn ⑦ & ⑧ We have to draw small signal equivalent circuit

