

44 Lecture - PHY301

Important Subjective

What is an emitter-stabilized bias circuit?

Answer: An emitter-stabilized bias circuit is a type of biasing circuit used in transistor amplifiers, which provides a stable operating point by using a negative feedback loop.

What is a load line in a transistor circuit?

Answer: A load line is a graphical representation of the relationship between the output voltage and current in a transistor circuit, which is used to determine the operating point of the circuit.

What is the purpose of the emitter resistor in an emitter-stabilized bias circuit?

Answer: The emitter resistor is used to provide negative feedback, which stabilizes the operating point of the transistor and improves its linearity.

How is the Q-point determined in an emitter-stabilized bias circuit?

Answer: The Q-point, or the operating point, is determined by the intersection of the load line and the DC bias line.

What happens to the Q-point if the emitter resistor is increased?

Answer: If the emitter resistor is increased, the Q-point will move towards the center of the load line.

How does the AC signal affect the emitter-stabilized bias circuit?

Answer: The AC signal causes a small variation in the collector current and voltage, which moves the operating point along the load line.

What is the purpose of the bypass capacitor in an emitter-stabilized bias circuit?

Answer: The bypass capacitor is used to bypass the AC signal around the emitter resistor, which prevents negative feedback from affecting the AC signal.

What is the difference between a fixed bias circuit and an emitter-stabilized bias circuit?

Answer: In a fixed bias circuit, the Q-point is fixed and does not change with variations in temperature or transistor parameters. In an emitter-stabilized bias circuit, the negative feedback stabilizes the Q-point and compensates for variations in temperature and transistor parameters.

How is the emitter-stabilized bias circuit affected by variations in temperature?

Answer: Variations in temperature cause the transistor parameters to change, which affects the Q-point. The negative feedback in the emitter-stabilized bias circuit compensates for these variations and stabilizes the Q-point.

How does the value of the emitter resistor affect the gain of the emitter-stabilized bias circuit?

Answer: The value of the emitter resistor affects the gain of the circuit by changing the slope of the load line. A smaller emitter resistor will result in a steeper load line and a higher gain, while a larger emitter resistor will result in a flatter load line and a lower gain.