
□ Relevant Table of Contents (Main Chapters)

1. Semiconductors and PN Junction Diode

- Intrinsic and extrinsic semiconductors
- PN junction formation
- Diode characteristics
- Zener diode
- LED and photodiode applications

2. Rectifiers and Power Supplies

- Half-wave rectifier
- Full-wave and bridge rectifiers
- Filters (capacitor and inductor filters)
- Voltage regulation (Zener regulator, IC regulators)

3. Bipolar Junction Transistors (BJT)

- Structure and working principle
- Transistor configurations (CB, CE, CC)
- Biasing techniques
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4. Transistor Amplifiers

- Small signal amplifiers
- Voltage, current, and power gain
- Frequency response
- Distortion and stability

5. Field Effect Transistors (FET and MOSFET)

- Construction and operation
- JFET and MOSFET types
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6. Oscillators

- Feedback concept
- RC and LC oscillators
- Wien bridge oscillator

- Frequency determination

7. Operational Amplifiers (Op-Amps)

- Ideal op-amp characteristics
- Inverting and non-inverting amplifiers
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- Comparators and filters

8. Basic Digital Electronics

- Number systems (binary, decimal, hexadecimal)
- Logic gates
- Boolean algebra
- Combinational circuits

9. Sequential Logic Circuits

- Flip-flops (SR, JK, D, T)
- Counters (asynchronous and synchronous)
- Shift registers

10. Basic Communication Systems

- Amplitude modulation (AM)
- Frequency modulation (FM)
- Transmission and reception systems