

Keonics Certified Embedded System

Duration: 2 Months

Basic Electronics

1. Semi Conductors Diodes and Applications

- 1.1 P-N Junction Diode
- 1.2 Characteristics and Parameters
- 1.3 The Diode Current Equation & Forward Bias Characteristics
- 1.4 The Diode Current Equation & Reverse Bias Characteristics
- 1.5 Diode Approximations
- 1.6 D.C Load Line
- 1.7 Temperature Dependence of V-I Characteristics
- 1.8 A.C Equivalent Circuits
- 1.9 Zener Diode
- 1.10 Half-Wave Diode Rectifier
- 1.11 Full-Wave Rectifier
- 1.12 Approximate Analysis of Capacitor Filter
- 1.13 Power Supply Performance
- 1.14 Zener Diode Voltage Regulators
- 1.15 Performances-Conventional Approach

2. Transistors

- 2.1 Introduction
- 2.2 The Bipolar Junction Transistor
- 2.3 Unbiased PNP and NPN
- 2.4 Principal of Operation of a PNP Transistor
- 2.5 Principle of Operation of an NPN Transistor
- 2.6 Transistor Voltages and Currents
- 2.7 Amplification
- 2.8 Common Base Characteristics
- 2.9 Common Emitter Characteristics
- 2.10 Common Collector Characteristics
- 2.11 Common Collector Characteristics
- 2.12 D.C Load Line and Bias Point

3. Other Devices

- 3.1 Silicon Controlled Rectifies (SCR)
- 3.2 SCR Characteristics and Parameters
- 3.3 Pulse Control of an SCR
- 3.4 More SCR Applications
- 3.5 Uni junction Transistor (UJT)
- 3.6 Field Effect Transistor (FET)
- 3.7 FET Amplification

4. Amplifiers & Oscillators

- 4.1 Decibels and Half-Power Points
- 4.2 Single Stage CE Amplifier
- 4.3 Resistance-Capacitance Coupled Two-Stage Amplifier
- 4.4 Series Voltage Negative Feedback
- 4.5 Additional Effects of Negative Feedback
- 4.6 Barkhausen Criterion
- 4.7 RC Phase Shift Oscillators
- 4.8 Colpitts Oscillator
- 4.9 Hartley Oscillator
- 4.10 Crystal Oscillator

5. Communication System

- 5.1 Block Diagram of communication System
- 5.2 Modulation
- 5.3 Radio Systems
- 5.4 Superheterodyne Receivers
- 5.5 Numerical Examples

6. Digital Logic

- 6.1 Boolean algebra
- 6.2 Logic Gates
- 6.3 OR Gate
- 6.4 AND Gate
- 6.5 NOT Gate
- 6.6 NAND Gate
- 6.7 NOR Gate
- 6.8 XOR Gate
- 6.9 XNOR Gate

- 6.10 Half-adder
- 6.11 Full-adder
- 6.12 Parallel Binary adder

7. Introduction to Embedded Systems

- 7.1 Brief Introduction
- 7.2 Classifications of Embedded Systems
- 7.3 Characteristics of an Embedded System
- 7.4 Applications of an Embedded Systems

8. Introduction to Embedded C Programming

- 8.1 Assembly Vs. C
- 8.2 What is Embedded C
- 8.3 C Vs. Embedded C
- 8.4 C Programming
- 8.5 Data types, operators and Variables
- 8.6 Storage Classes
- 8.7 Stack Frame Analysis
- 8.8 Functions
- 8.9 Arrays
- 8.10 Pointers
- 8.11 Structures
- 8.12 Advance C Programming Level 1
- 8.13 Pointers and Arrays
- 8.14 Pointers and Functions
- 8.15 Variable Argument Function
- 8.16 Memory Management
- 8.17 Structures
- 8.18 Structures and Array
- 8.19 Structures and Functions
- 8.20 Unions
- 8.21 Enumerations
- 8.22 Macros
- 8.23 GDB – Debug tool
- 8.24 Advance C programming level 2
- 8.25 Introduction to Data Structures
- 8.26 Types of Arrays
- 8.27 Linked Lists
- 8.28 Singly Linked List
- 8.29 Doubly Linked Lists
- 8.30 Circular lists
- 8.31 Sorting algorithms
- 8.32 Applications of Sorting Algorithm

- 8.33 Searching Algorithm
- 8.34 Stacks
- 8.35 Applications of Stack
- 8.36 Queues
- 8.37 Applications of Queues
- 8.38 Deque
- 8.39 Circular Queues
- 8.40 Priority Queues

9. Basics of Micro controllers

- 9.1 What are Micro Processors?
- 9.2 What is Micro Controller?
- 9.3 Difference between Micro controller and Microprocessor
- 9.4 Difference between Von Newman and Harvard Architectures
- 9.5 Difference between CISC & RISC Architectures
- 9.6 Overview of MCS51 Family

10. Intel 8051 Architecture

- 10.1 Features of 8051 micro controller
- 10.2 Internal ROM memory Architecture
- 10.3 Internal RAM Memory Architecture
- 10.4 Pin out detail of 8051 micro controller
- 10.5 Instruction Set
- 10.6 Data Transfer Instruction Set
- 10.7 Arithmetic Instruction Set
- 10.8 Bitwise and Byte wise Logical Instruction Set
- 10.9 Rotate Instruction Set
- 10.10 Call and Jump Instruction Set
- 10.11 Stack Operation and its architecture

11. Programming 8051 in Assembly

- 11.1 Introduction to Assembly level Programming
- 11.2 Assembly Programming
- 11.3 IO Port Programming
- 11.4 Timer and Counter Programming
- 11.5 Serial Port Programming
- 11.6 Interrupt Handling

12. Keil C Programming and Interfacing 8051 with peripherals and devices

- 12.1 Need of Cross Compiler
- 12.2 Popular Cross Compilers
- 12.3 What and Why Compiler Directives

- 12.4 Overview of μ vision Development. Tools
- 12.5 Environmental settings required to run a Keil C program
- 12.6 Introduction to Keil C
- 12.7 Intermixing C and Assembly
- 12.8 Interfacing Techniques
 - 12.8.1 IO Port Interface
 - 12.8.1 Interfacing LED
 - 12.8.3 Interfacing Liquid Crystal Display (LCD)
 - 12.8.4 Interfacing a Keypad
 - 12.8.5 Interfacing EEPROM
 - 12.8.6 Interfacing ADC
 - 12.8.7 Interfacing Sensors
 - 12.8.8 Interfacing DAC
 - 12.8.9 Interfacing Stepper Motor
 - 12.8.10 Interfacing DC Motor
- 12.9 Advanced Programming Issues
- 12.10 What is and Why Optimization.
- 12.11 What are 8051 Specific Optimization supported by Cx51
- 12.12 Difference between Keil C and ANSI C