

CTE650

Design and implementation of PAM and PPM modulator and demodulator

Design and implementation of DPSK modulator and demodulator

Design and implementation of FHSS Frequency Hopping Spread Spectrum encoder and decoder

Design and implementation of Phase-Locked Loop Circuits

Design and implementation of MSK modulator and demodulator

Curriculum Objectives:

To understand the basic theory of communication.

Design and implementation ability training of digital modulator and demodulator.

Ability to research and develop the digital modulator and demodulator.

Become familiar with the application of communication with modulator circuit.



A. Module PAM:

1: Modulatore PAM

Sampling Rate: 10 kHz ~ 20 kHz
 Sampling Signal Format: TTL Waveform
 Audio Signal: 1 kHz ~ 2 kHz
 Audio Input Format: Sine Waveform
 Modulation Output Format: Pulse Waveform
 Adjustable Amplitude of Output Signal

2: Demodulatore PAM

Sampling Rate: 10 kHz ~ 20 kHz
 Sampling Signal Format: TTL Waveform
 Audio Signal: 1 kHz ~ 2 kHz
 Built-in Low-pass Filter-3 dB Frequency: 1 kHz ~ 3 kHz

B. Module PPM:

3: Modulatore PPM

Sampling Rate: 30 kHz ~ 45 kHz
 Sampling Signal Format: Triangle Waveform
 Audio Signal: 1 kHz ~ 2 kHz
 Audio Input Format: Sine Waveform
 Modulation Output Format: Pulse Waveform

4: Demodulatore PPM

Sampling Rate: 30 kHz ~ 45 kHz
 Sampling Signal Format: Triangle Waveform
 Audio Signal: 1 kHz ~ 2 kHz
 Built-in Low-pass Filter -3 dB Frequency: 1 kHz ~ 3 kHz

C. Module DPSK:

5: Modulatore DPSK

Clock: 200 Hz ~ 400 Hz
 Clock Format: TTL Waveform
 Data Rate: 100 bps ~ 200 bps
 Data Input Format: Serial Input
 Carrier Signal: 20 kHz
 Data Signal Format: TTL Waveform
 Built-in Data Simulation Generator
 Built-in Differential Encoding Generator

6: Demodulatore DPSK

Clock: 200 Hz ~ 400 Hz
 Clock Format: TTL Waveform
 Data Rate: 100 bps ~ 200 bps
 Data Output Format: Serial Output
 Carrier Signal: 20 kHz
 Built-in Differential Decoding Generator

D. Module FHSS:

7: FHSS Spread Spectrum Encoder

Data Setting Length: 12 bits
 Data Input Mode: Press-button Switch
 Data Display Mode: LED Display
 Channel Indicator: LED Display
 Carrier Frequency: 20 kHz, 40 kHz, 60 kHz
 Adopting ASK Modulation Structure

8: FHSS Spread Spectrum Decoder

Data Display Length: 12 bits
 Data Display Format: LED Display
 Channel Indicator: LED Display
 Carrier Frequency: 20 kHz, 40 kHz, 60 kHz
 Adopting Active Mode Structure Demodulation



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E. Module HF/RF PLL Circuits:

9: HF PLL Circuits

Reference Clock Frequency: 1 MHz
 Divider Ratio of Programmable Reference Clock: 1 ~ 100
 Divider Ratio of Programmable Counter: 1 ~ 100
 Divider Ratio Setting: DIP Switch
 Output Frequency Range: 20 kHz ~ 1.2 MHz
 HF PLL IC: 4046

10: RF PLL Circuits

Reference Clock Frequency: 6 MHz
 Programmable Reference Clock Frequency: 12.5 kHz
 Input Frequency Setting: Keypad
 Output Locked Frequency: 800 MHz, 812 MHz, 825 MHz
 Text Information Display: LCD Display
 Controlled Values of Programmable Counter Being Generated from 89C51
 RF PLL IC: MB15E03

F. Module MSK:

11: Modulator MSK

Audio Signal: 2 kHz
 Modulation Index Selector: DIP Switch
 Modulation Index: 0.5, 0.7, 1
 Input Signal Format: TTL Waveform
 Modulation Output Signal Format: Sine Waveform

12: Demodulator MSK

Audio Signal: 2 kHz
 Output Signal Format: TTL Waveform
 Modulation Index: 0.5, 0.7, 1
 Nature Frequency: 10 kHz ~ 30 kHz
 Phase Locked Frequencies Range: 18 kHz ~ 22 kHz
 Phase Capture Frequencies Range: 18.5 kHz ~ 21.5 kHz

