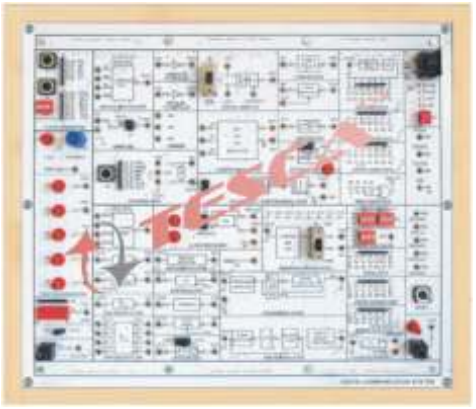
Order Code - 40651
VLSI Based Digital Communication Training System



SPECIFICATIONS:

Clock and signal generation section

Sine wave

- Fixed frequency : 250Hz, 500Hz, 1 KHz, 2 Khz
- Variable frequency : 1Hz ~ 30Hz, 0 ~ 2 Vpp

Sampling clock

- Frequency : 2 KHz, 4 KHz, 8 KHz, 16 KHz,32 KHz, 64 KHz, 128 Khz
- Duty cycle : 10 ~ 90% Selectable in steps of 10%
- DC signal : 0 ~ 5 V
- Transmitter clock frequency :240 KHz fast modes
- Transmitter frame frequency :8 Khz
- Carrier sine waves : 500 KHz (0^0), 1MHz (0^0), 1MHz (180^0)
- Data pattern : 8-bit variable NRZ-L pattern
- PRBS generator : 14-bit

Transmitter Section

- Analog signal sampling ,Sample and hold, Natural sampling,Flat-top sampling
- 4 channel analog time division multiplexing
- Odd, even parity and hamming code generator
- Pulse code modulation
- ASK, FSK, PSK modulation
- Data encoding NRZ (L), NRZ (M), NRZ(S), Bi-phase (Manchester), Bi-phase (Mark), Bi-phase (Space), URZ, alternate mark inversion (AMI), uni-polar to bipolar and bipolar to uni-polar
- Delta / adaptive delta / sigma delta / CVSD modulation
- Signal compression
- PAM / PPM / PWM modulation
- Audio preamplifier with microphone interface

Receiver section

- 2^{nd} order and 4^{th} order low pass Butterworth filters
- 4 channel time division de-multiplexing
- PLL clock recovery
- Pulse code demodulation
- Odd, even parity and hamming code recovery
- Single bit error detection and correction
- Data decoding NRZ(L), NRZ(M), NRZ(S), Bi-phase (Manchester), Bi-phase (Mark), Bi-phase (Space), URZ, alternate mark inversion (AMI)
- ASK, FSK, PSK demodulation
- Delta / adaptive delta / sigma delta / CVSD demodulation
- Signal expander
- PAM / PPM / PWM demodulation
- Audio amplifier with headphone / speaker interface

Note: Specifications are subject to change.

EXPERIMENTS:

Study of sampling techniques

- Natural sampling, Sample and hold, Flat top sampling

Effect of various sampling frequencies and duty cycles

- Effect of sampling frequency Effect of duty cycle

Effect of order of the low pass filter

Study of TDM with different receiver synchronization techniques

- Using the direct synchronization technique
- Clock recovery through PLI
- Clock recovery through threshold detector

Study of pulse code modulation and demodulation

- Direct synchronization technique
- Bit synchronization technique
- Frame synchronization technique

Effects of parities and hamming code on PCM data

- None parity, Even parity, Odd parity, Hamming code

Study of PRBS

Study of various data encoding and decoding techniques

- NRZ- L, NRZ- M, NRZ- S. 810-1. BlO-M, 810-S. URZ
- AMI encoding and decoding
- Unipolar to bipolar
- Bipolar to unipolar

Study of various carrier modulation and demodulation techniques

- ASK modulation and demodulation
- FSK modulation and demodulation
- PSK modulation and demodulation
- Study of delta modulation and demodulation
- Study of slope overload and increased integrator gain
- Study of adaptive delta modulation and demodulation
- Study of sigma delta modulation and demodulation
- Study of continuously variable slope detector modulation and demodulation.
- Study of companding system
- Voice communication
- Study of pulse width modulation and demodulation.
- Study of pulse position modulation and demodulation
- Switch faults

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