VL5301 ANALOG TO DIGITAL INTERFACES

DETAILED SYLLABUS

OBJECTIVES

- To understand the importance of sampling the input analog signal for digitization and enabling circuit architectures
- To understand the principles of Analog to Digital and Digital to Analog conversion of signals.
- To understand the importance of calibration techniques for achieving precision during data conversion

UNIT I SAMPLE AND HOLD CIRCUITS

Sampling switches, Conventional open loop and closed loop sample and hold architecture, Open loop architecture with miller compensation, multiplexed input architectures, recycling architecture switched capacitor architecture.

UNIT II SWITCHED CAPACITOR CIRCUITS AND COMPARATORS

Switched-capacitor amplifiers, switched capacitor integrator, switched capacitor common mode feedback. Single stage amplifier as comparator, cascaded amplifier stages as comparator, latched comparators.

UNIT III DIGITAL TO ANALOG CONVERSION

Performance metrics, reference multiplication and division, switching and logic functions in DAC, Resistor ladder DAC architecture, current steering DAC architecture.

UNIT IV ANALOG TO DIGITAL CONVERSION

Performance metric, Flash architecture, Pipelined Architecture, Successive approximation architecture, Time interleaved architecture.

UNIT V PRECISION TECHNIQUES

Comparator offset cancellation, Op Amp offset cancellation, Calibration techniques, range overlap and digital correction.

REFERENCE:

1. Behzad Razavi, "Principles of data conversion system design", S. Chand and company Ltd, 2000.