Lecture 38

Σ-Δ modulator

- Σ-Δ name

- Unlike other ADC types,
- Negative feedback theory:
- (Parallel) binary output is obtained

Refer to the schematic
- op-amp #1
- op-amp #2
- op-amp #3
Nyquist sampling criterion & aliasing

- if

- if

- if

$S$

signal with $f < f_s$

measured freq.

actual freq.
Effect of conversion time ($t_c$) on resolution

$$V_{in} = V_0 \sin (2\pi ft)$$

$$V_{p-p} = 2V_0$$

E.g. 8-bit ADC with $t_c = 10\,\mu s$ (100kHz)
Sample & hold circuit

General A/D converter layout

Digital scopes
  Sampling
  Real-time