Enhancement Presentation

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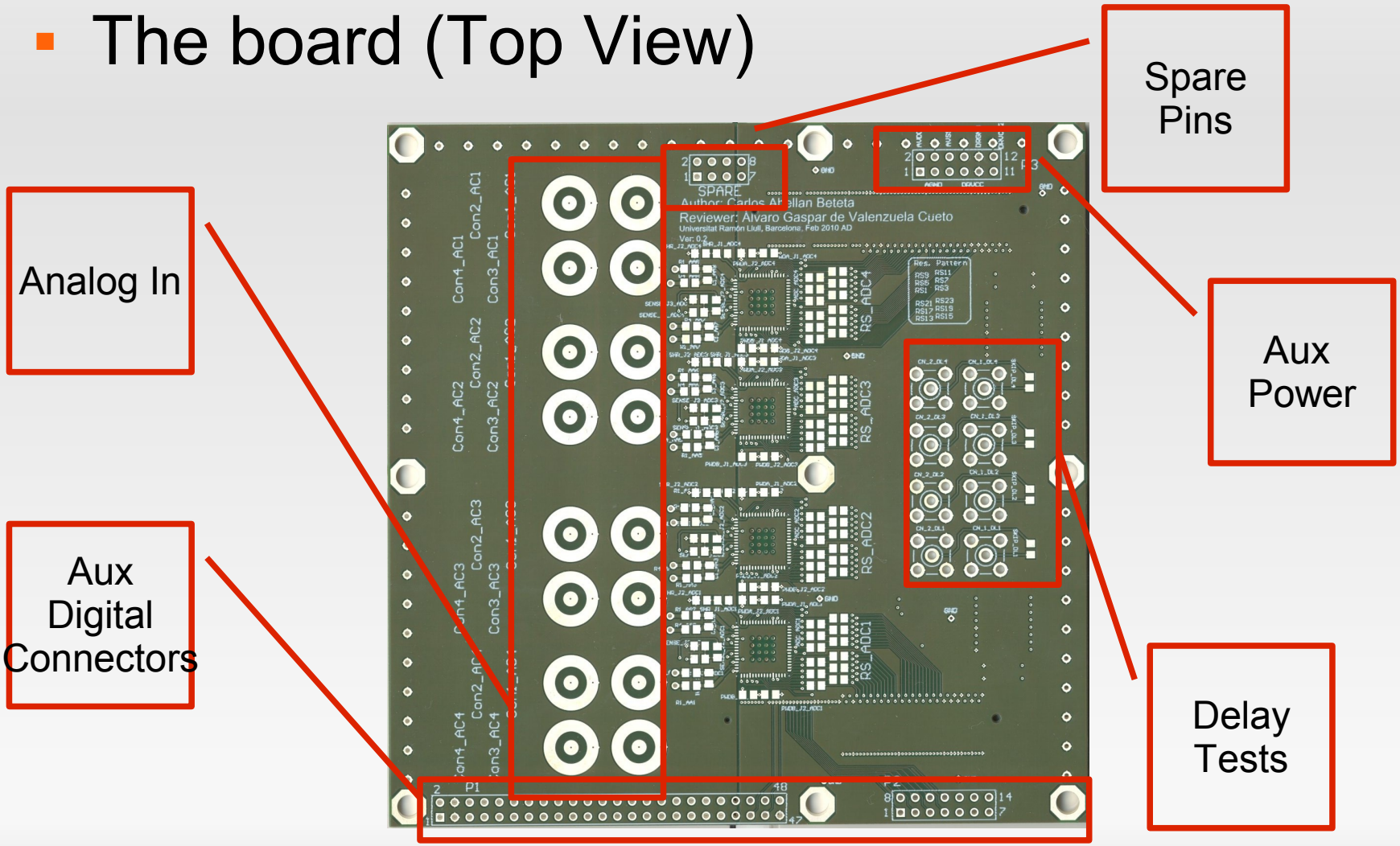
Barcelona May, 5th 2010

Enhancement Presentation

- Summary
  - Analogue Mezzanine Board
    - Issues with ADC
    - Break out board
    - Digital Connector
  - Discrete Electronics Simulation
    - Delay lines
    - Linearity
    - Noise

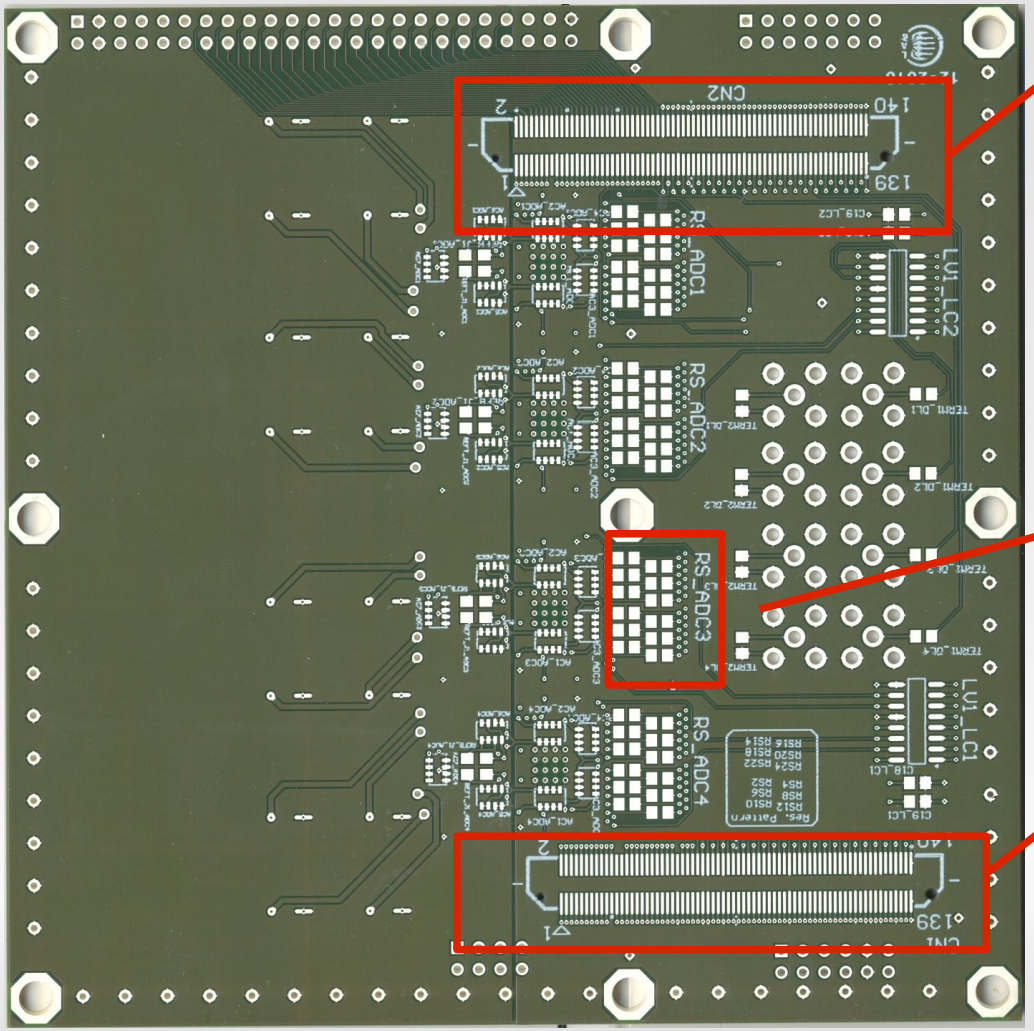
Analogue Mezzanine Board

- The board (Top View)



Analogue Mezzanine Board

- The board (Bottom View)



Down Connector

Be aware!!
BOTTOM VIEW!!

Series Resistors ADC Out

Up Connector

Analogue Mezzanine Board

- Issues with the ADC

LQFP vs. LFCSP

LFCSP not found in stock

6 weeks delay!!

LQFP inadequate pinout

44 currently on my desk

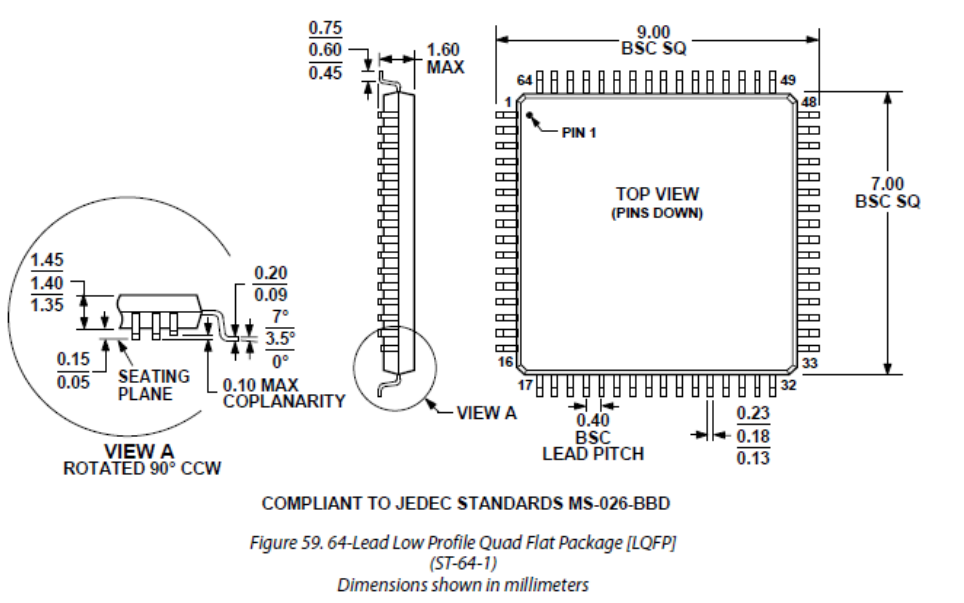


Figure 59. 64-Lead Low Profile Quad Flat Package [LQFP]
(ST-64-1)
Dimensions shown in millimeters

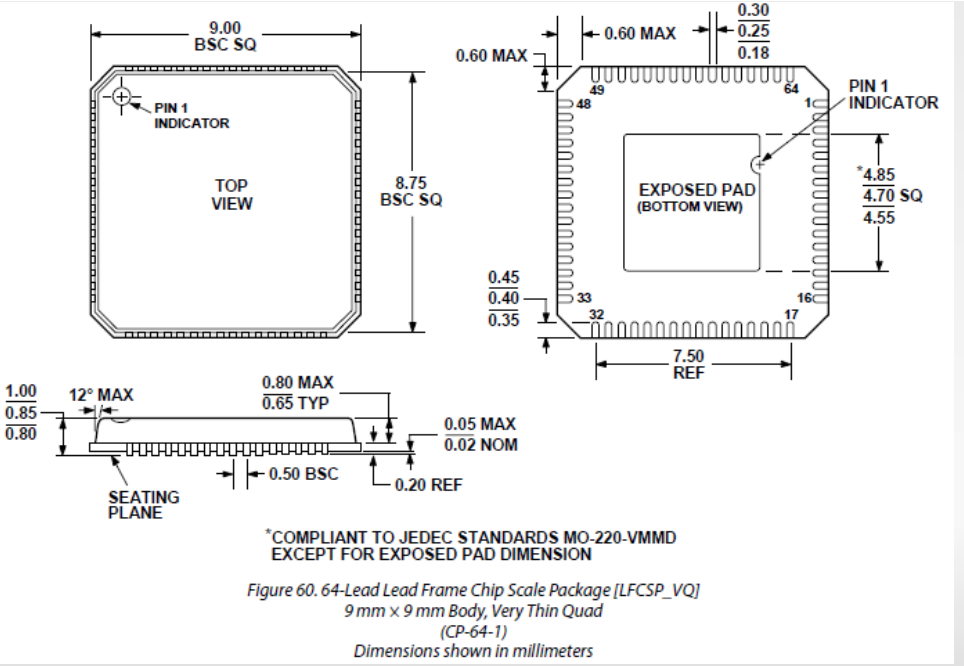
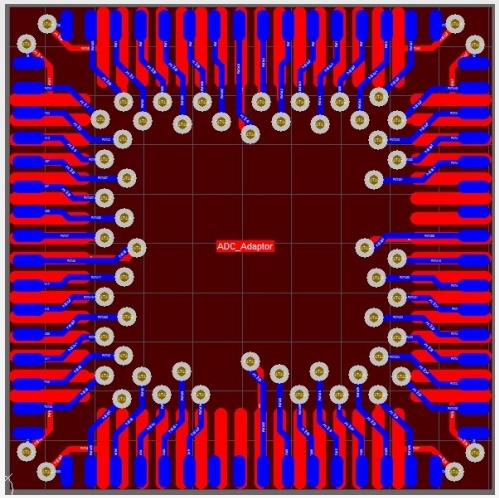


Figure 60. 64-Lead Lead Frame Chip Scale Package [LFCSP_VQ]
9 mm × 9 mm Body, Very Thin Quad
(CP-64-1)
Dimensions shown in millimeters

Analogue Mezzanine Board

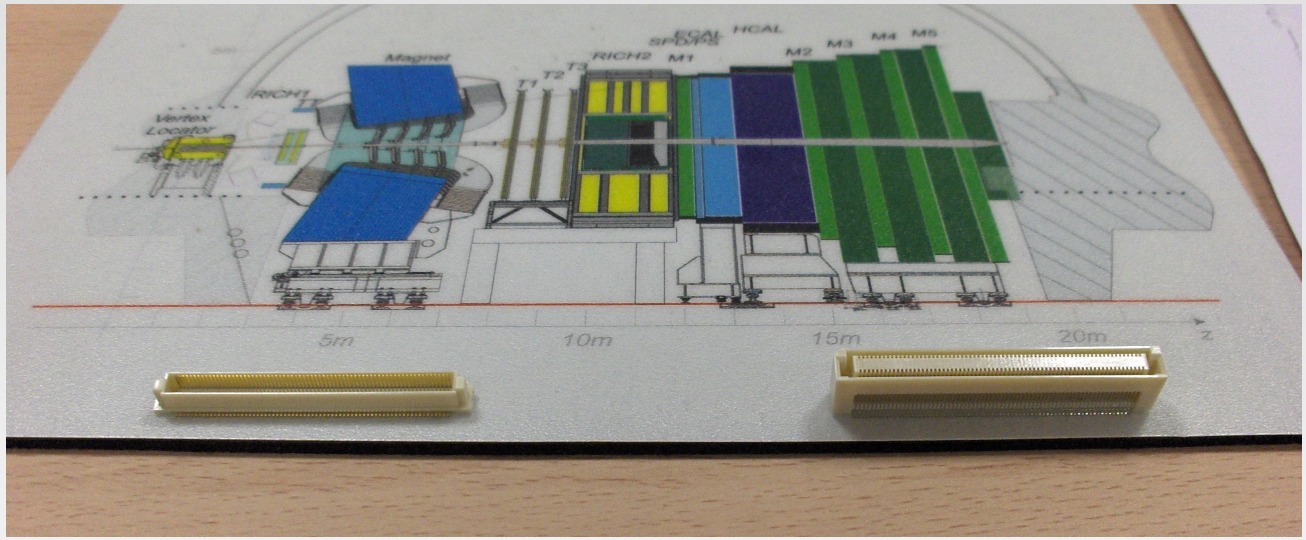
- Issues with the ADC
  - Possible solutions:
    - Wait for the ADC
    - Small adaptor board



- Break out board for mezzanine

Analogue Mezzanine Board

- Digital Connector (just to make it clear)



Mezzanine(Jane)

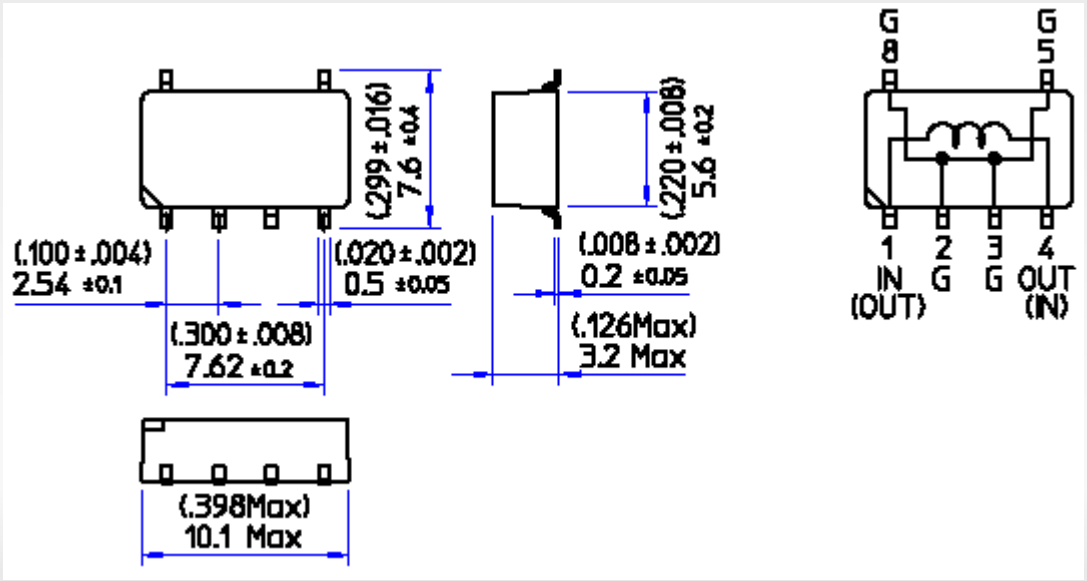
Mother Board(Tarzan)

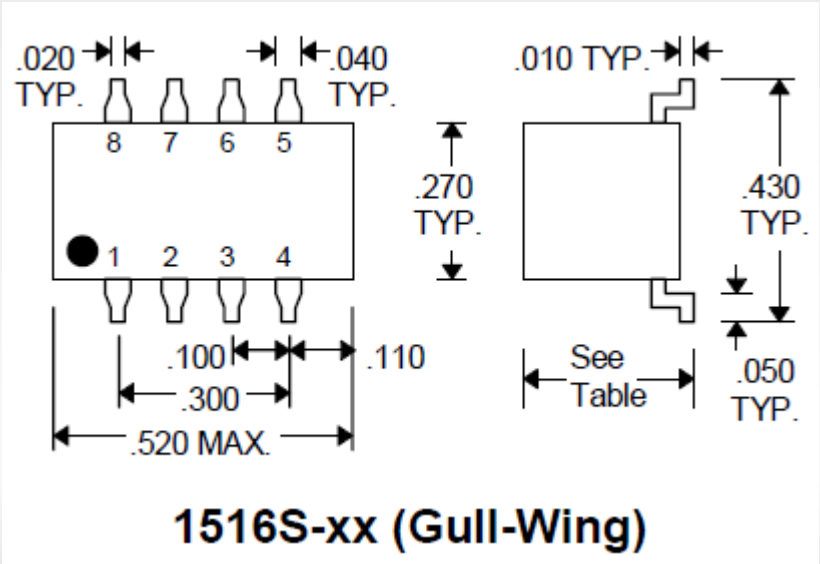
Discrete Electronics Simulation

- Simulation tools
  - Synopsys Saber
    - Uncommon language
    - Bad GUI
  - Cadence Spectre
    - Hard to install
    - Hard learning curve
    - Not intended for this purpose
  - Synopsys Hspice
    - Has no GUI (solved with gEDA)
    - Native SPICE

Discrete Electronics Simulation

- Delay Lines
  - Commercial models
    - Many small sized found
    - Bad delay tolerances
    - 5% or 2ns whichever is greater

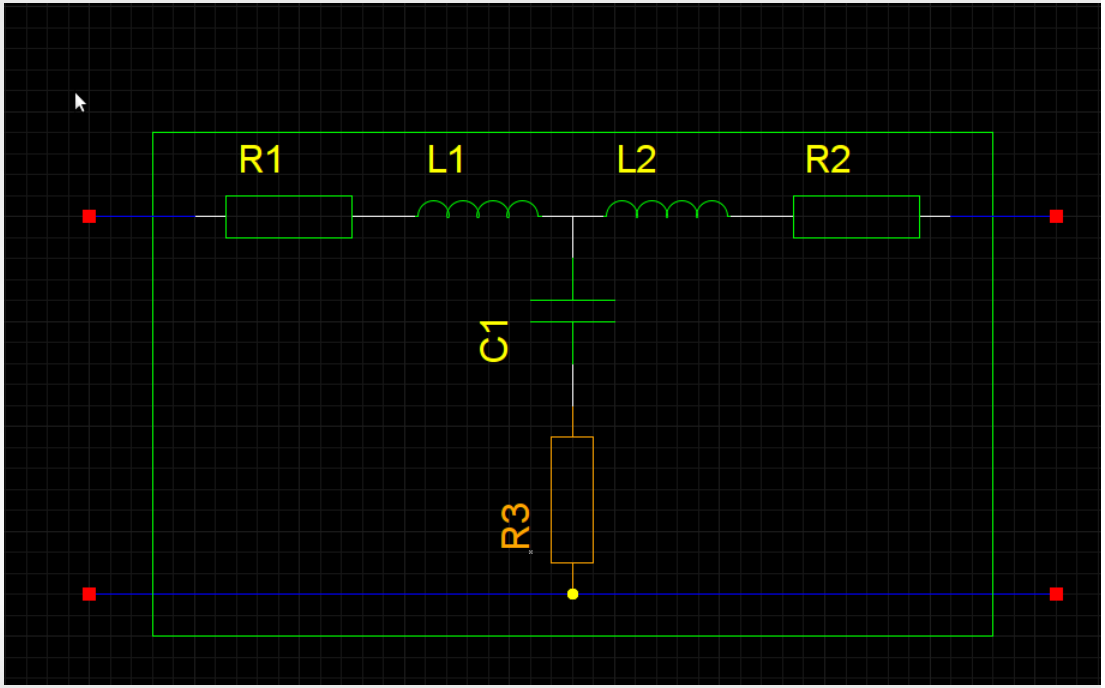


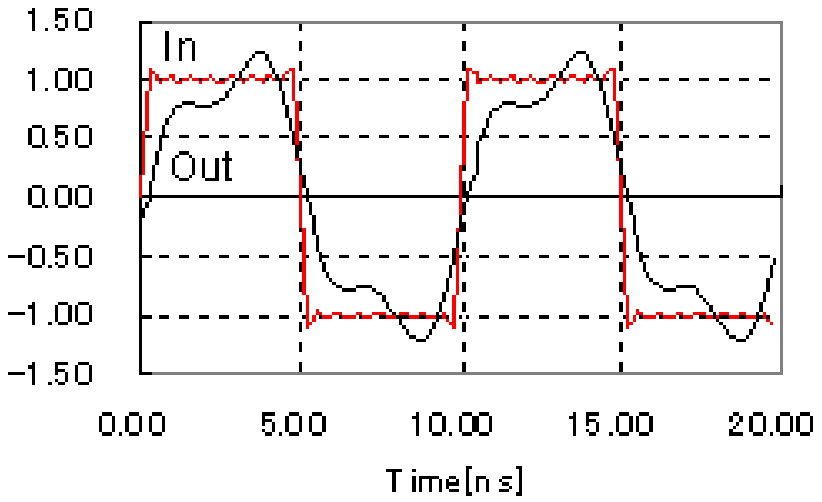


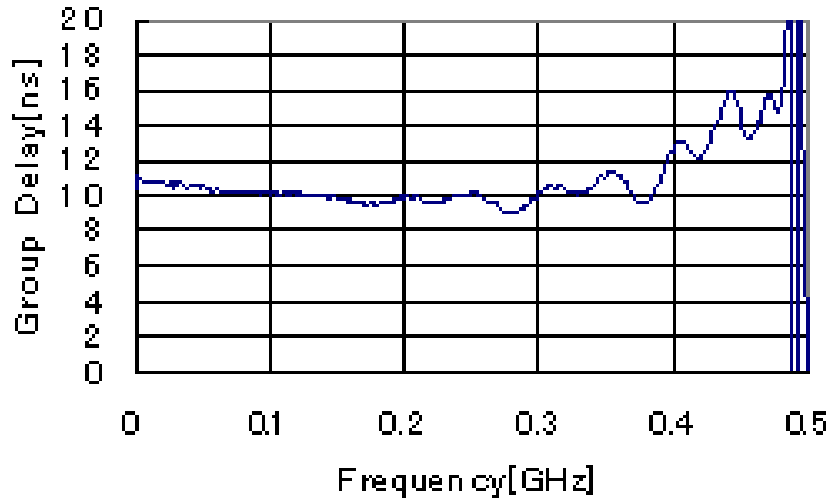
1516S-xx (Gull-Wing)

Discrete Electronics Simulation

- Delay Lines
  - Spice modeling
  - Asked to vendor

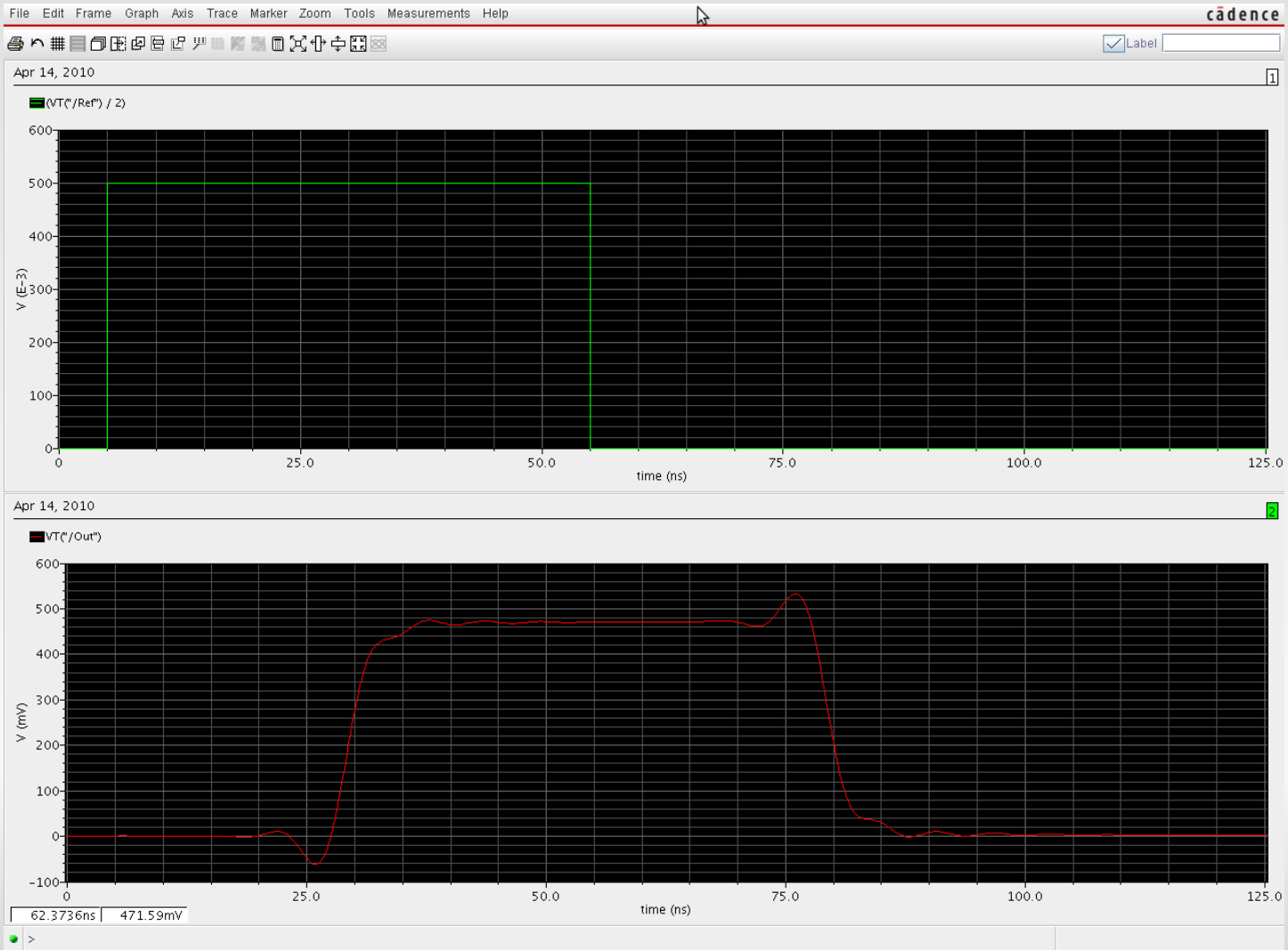






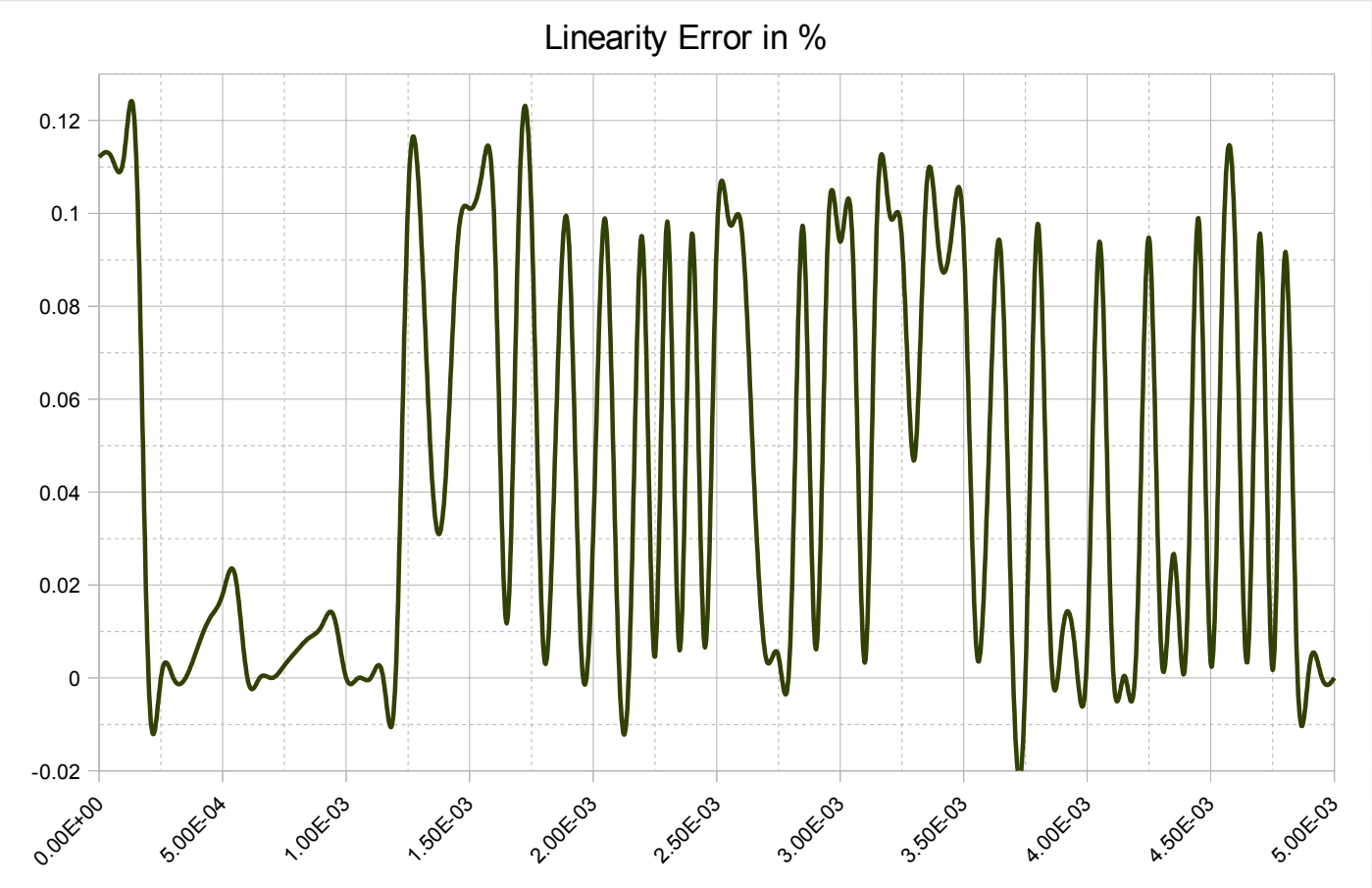
Discrete Electronics Simulation

- Delay Lines
  - Spice simulations, Accurate? → Measurement



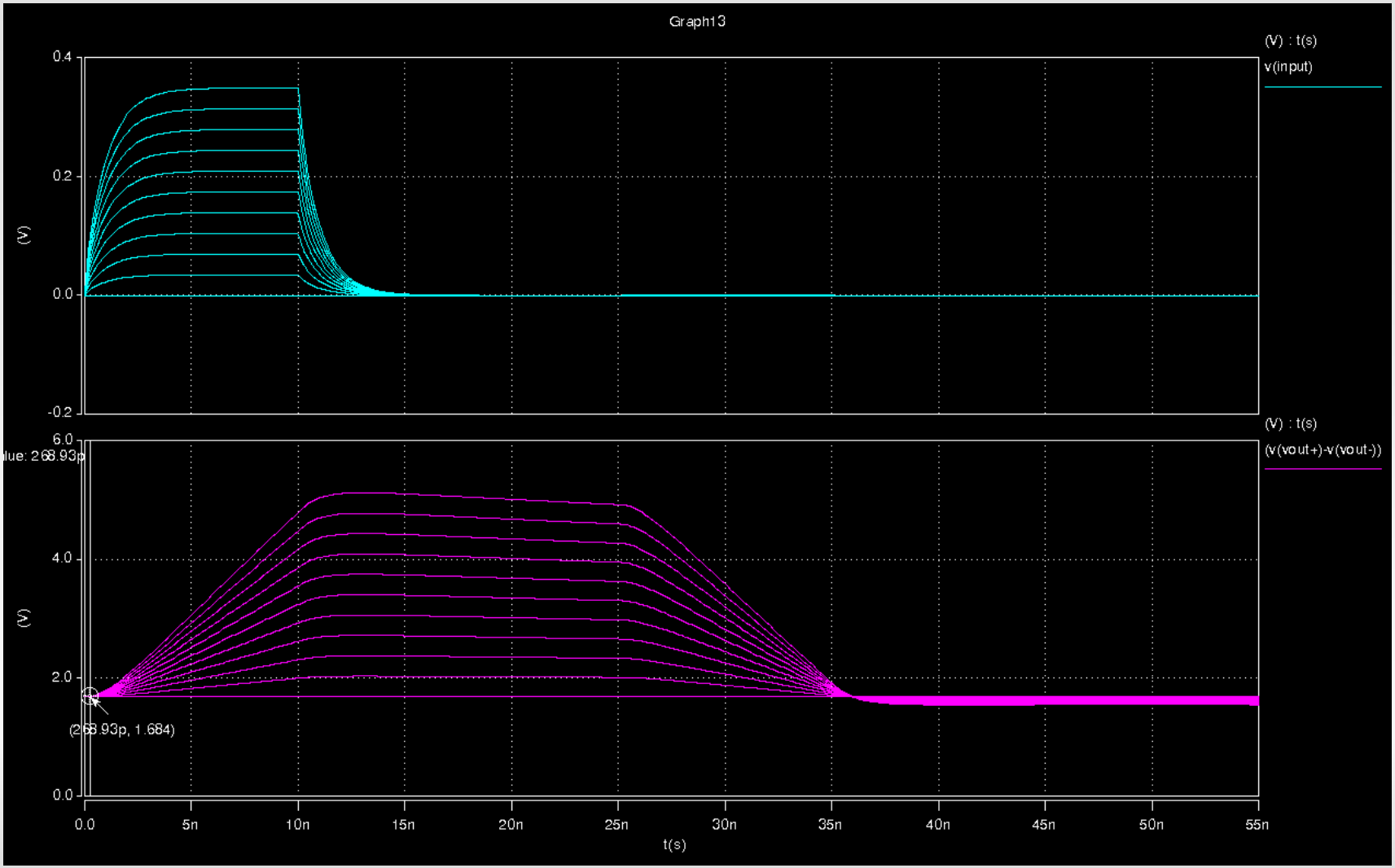
Discrete Electronics Simulation

- Linearity
  - Definition: Charge/Voltage [C/V]
  - Simulated Linearity Error



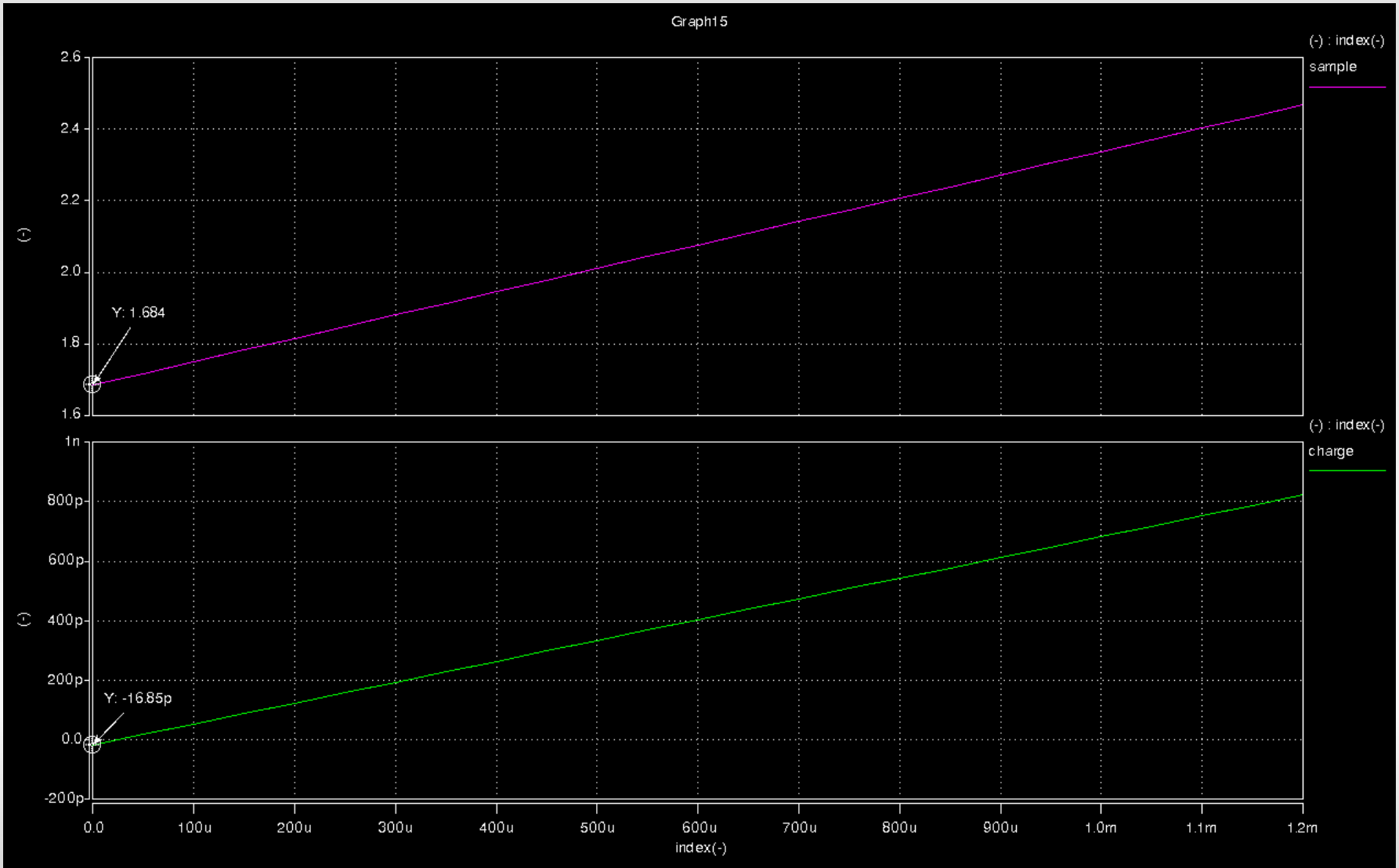
Discrete Electronics Simulation

- Linearity
  - Simulation



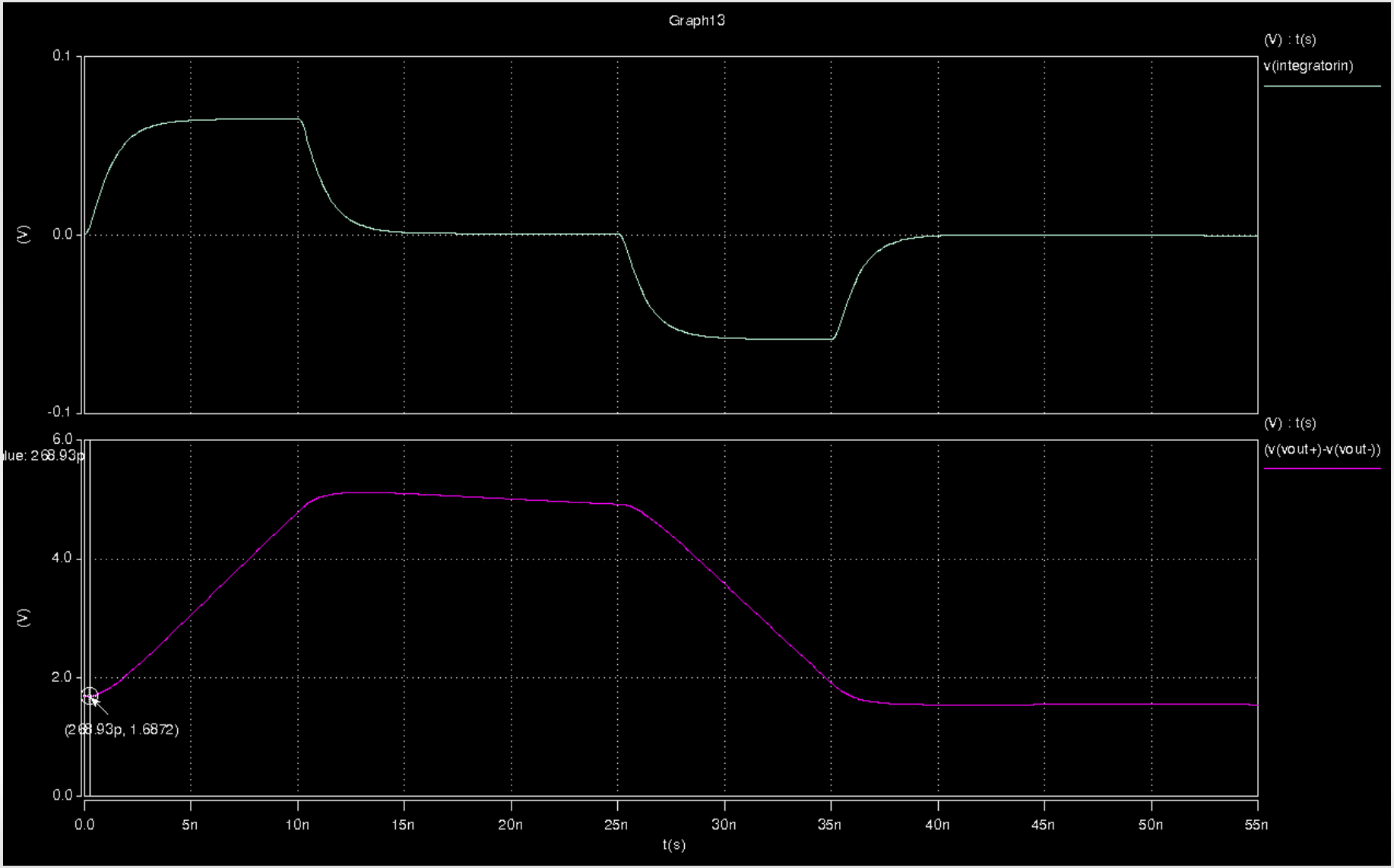
Discrete Electronics Simulation

- Linearity
  - Simulation



Discrete Electronics Simulation

- Error simulation: $e = \int_0^t Input(\tau)\,d\tau - Output(t)$



Discrete Electronics Simulation

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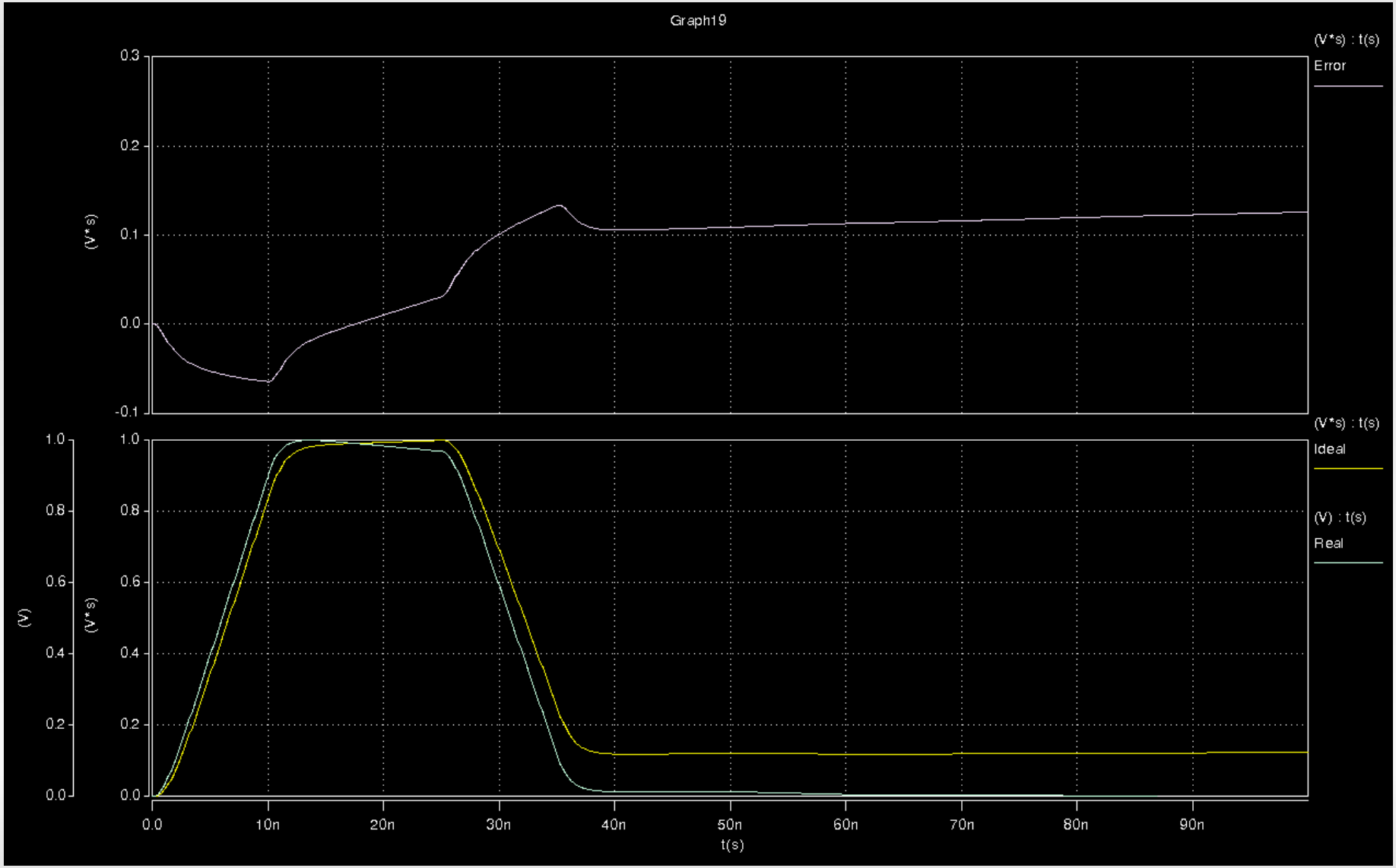

Discrete Electronics Simulation

- Further Steps
  - Noise
    - Problems in SPICE model
  - Real Delay Line simulation