

**Analog Integrated System Design****Lab 03****Data Converters Specifications****Lab Objective**

- 1) To be familiar with the leading manufacturers of data converters.
- 2) To be able to search for and read manufacturers datasheets.
- 3) To be familiar with the leading forums (conferences and journals) in IC design.
- 4) To be able to search for and read technical research papers.
- 5) To be able to analyze and compare data converters specifications.
- 6) To appreciate the gap between the FoM of industrial data converters and published papers.

**ADCs Comparison**

Select one ADC from ADI, one ADC from TI, and one ADC from papers published in one of the following top forums (in the last 10 years)<sup>1</sup>:

- Journal of Solid State Circuits (JSSC)
- International Solid-State Circuits Conference (ISSCC)
- VLSI Symposium

The ADCs you select must meet the specifications below.

<b>No. of bits</b>	12
<b>Sample rate</b>	$\geq 1$ MSps
<b>No. of channels</b>	1
<b>Input type</b>	Differential
<b>Max DNL</b>	$< 1$ LSB
<b>Max INL</b>	$< 1$ LSB
<b>Power consumption</b>	Minimum

Read the datasheets/papers and compare the following for the selected ADCs **in a table**.

- 1) Architecture (SAR, pipelined, etc.)
- 2) Block diagram
- 3) Price (\$)
- 4) Min power supply (V)
- 5) Peak-to-peak input range (V)
- 6) Power consumption at 1 MSps (mW)
- 7) Max DNL (LSB)
- 8) Max INL (LSB)
- 9) ENOB (bit)

<sup>1</sup> For industrial ADCs use the manufacturer parametric search (selection table). For papers, you may search IEEEExplore or use the survey available at this link:

<https://web.stanford.edu/~murmman/adcsurvey.html>

- 10) SNR (dB)
- 11) SINAD (dB)
- 12) SFDR (dB)
- 13) Digital output format (parallel, serial, etc.)
- 14) Internal reference (Yes/No)?
- 15) Internal sampling clock (Yes/No)?
- 16) Walden FoM (fJ/step)
- 17) Schreier FoM (dB)