**National Semiconductor**

**ADVANCE INFORMATION**
February 2004

# ADC081000
# 8-Bit, 1 GSPS A/D Converter with Internal Reference and Sample-and-Hold

## General Description

**NOTE: This product is currently in development. - ALL specifications are design targets and are subject to change.**

The ADC081000 is a low power, high performance CMOS analog-to-digital converter that digitizes signals to 8 bits resolution at sampling rates up to 1.6 GSPS while consuming a typical 1.4 Watts from a single 1.9 Volt supply at 1.0 GSPS. This device is guaranteed to have no missing codes over the full operating temperature range. The unique folding/interpolating architecture, the fully differential comparator design and the innovative design of the internal sample-and-hold amplifier enable a very flat SINAD/ENOB response beyond Nyquist, producing a high 7.5 ENOB with a 100 MHz input signal and a 1 GHz sample rate. Output formatting is offset binary coding with LVDS digital outputs compliant with IEEE 1596.3-1996, with the exception of a reduced common mode voltage of 0.8V.

The converter has a 1:2 demultiplexer that feeds two LVDS buses and reduces the output data rate on each bus to half the sampling rate. The data on these buses are interleaved in time to provide a 500 MSPS output rate per bus and a combined output rate of 1 GSPS.

Setting the PD (Power Down) pin high places the converter into an inactive power down state, where it typically consumes less than 5 mW.

The ADC081000 is available in a 128-lead exposed pad LQFP and operates over the industrial (-40$^o$C $\leq$ T$_A$ $\leq$ +85$^o$C) temperature range.

## Features

- Internal Sample-and-Hold
- Single +1.9V ±0.1V Operation
- Adjustable Output Levels
- Guaranteed No Missing Codes
- Low Power Standby Mode

## Key Specifications

- Resolution ................................................ 8 Bits
- Max Conversion Rate ......................... 1 GSPS (min)
- No Missing Codes .......................... Guaranteed
- ENOB @ 100 MHz Input .................... 7.5 Bits (typ)
- DNL ................................................ ±0.25 LSB (typ)
- Conversion Latency .................. 7/8 Clock Cycles
- PSRR .............................................. 40 dB (typ)
- Power Consumption
  — Operating ................................... 1.4 W (typ)
  — Power Down Mode ...................... 5 mW (typ)

## Applications

- Direct RF Down Conversion
- Digital Oscilloscopes
- RADAR / SONAR / ECM
- Satellite Set-top boxes
- WLANs
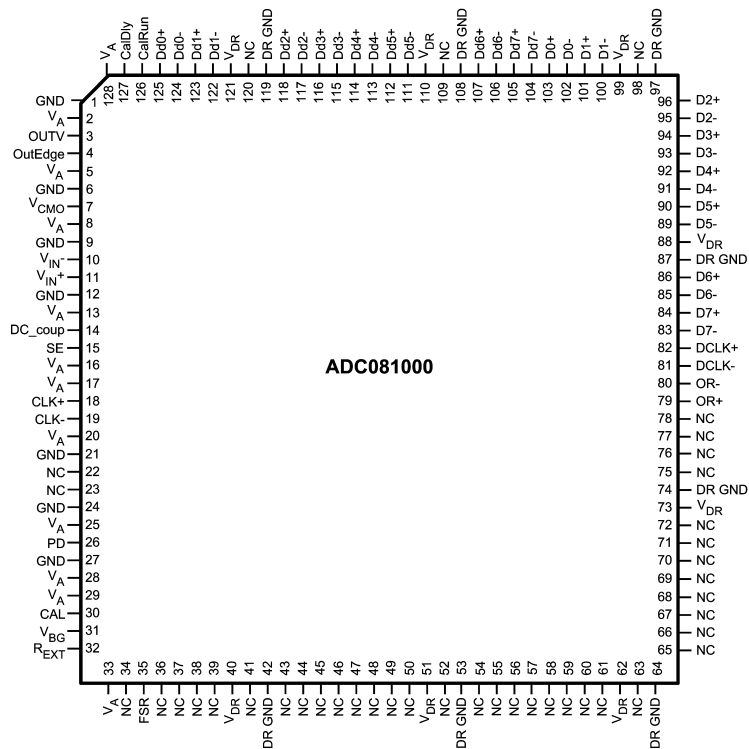- Communications Systems
- Test Instrumentation

## Block Diagram
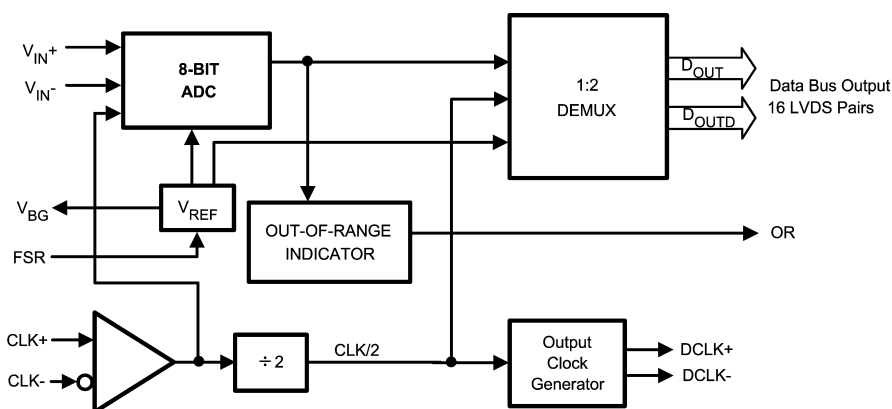


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# Ordering Information

| Extended Commercial Temperature Range (-40°C < $T_A$ < +85°C) | NS Package |
|---|---|
| ADC081000CIYB | 128-Pin Exposed Pad LQFP |
| ADC081000LEVAL | Evaluation Board |

# Pin Configuration



20068101

# Physical Dimensions inches (millimeters) unless otherwise noted

RECOMMENDED LAND PATTERN

DIMENSIONS ARE IN MILLIMETERS

DETAIL A
TYPICAL

VNX128A (Rev A)
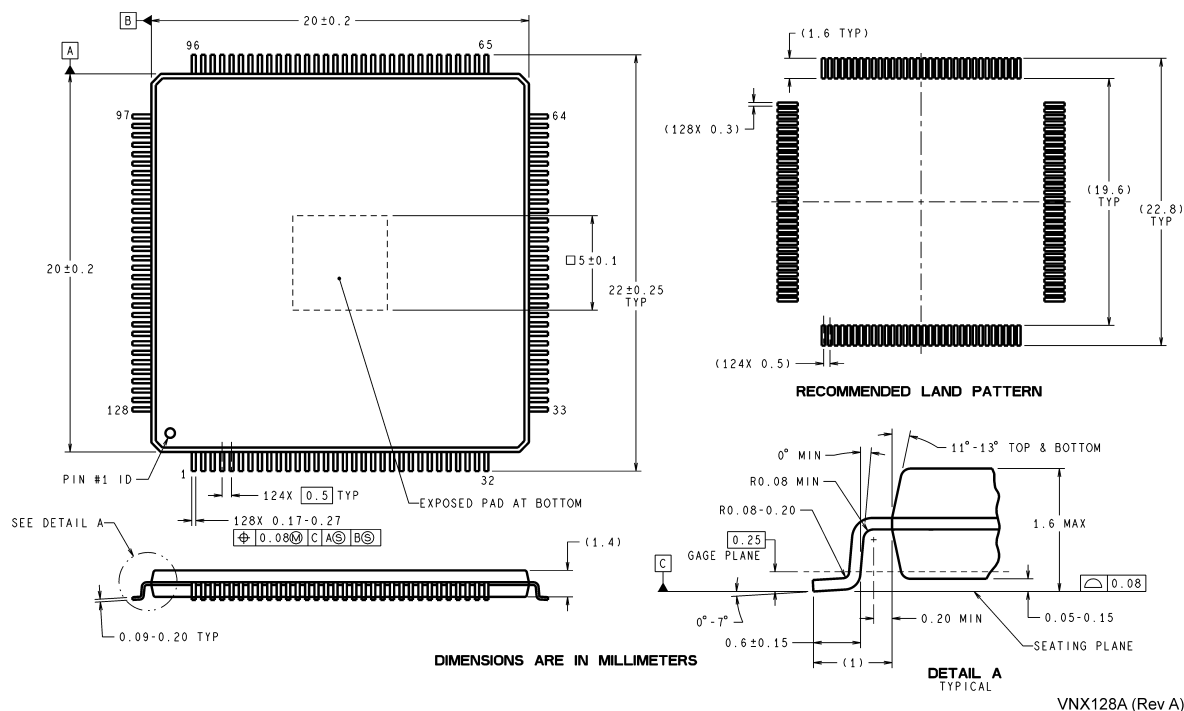
NOTES: UNLESS OTHERWISE SPECIFIED

REFERENCE JEDEC REGISTRATION MS-026, VARIATION BFB.

**24-Lead Package TC**
**Order Number ADC081000CIMT**
**NS Package Number VNX128A**

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