



## 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 ( $-40^{\circ}\text{C} \leq T_A \leq +85^{\circ}\text{C}$ ) temperature range.

## Features

- Internal Sample-and-Hold
- Single +1.9V  $\pm 0.1\text{V}$  Operation
- Adjustable Output Levels
- Guaranteed No Missing Codes
- Low Power Standby Mode

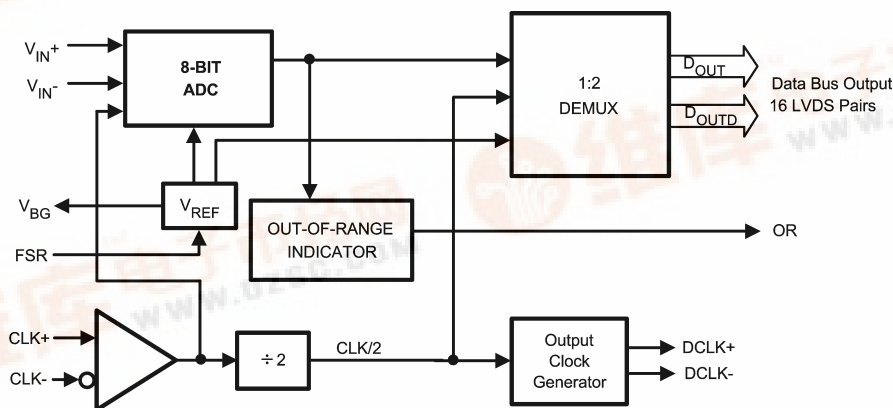
## Key Specifications

■ Resolution	8 Bits
■ Max Conversion Rate	1 GSPS (min)
■ No Missing Codes	Guaranteed
■ ENOB @ 100 MHz Input	7.5 Bits (typ)
■ DNL	$\pm 0.25$ 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



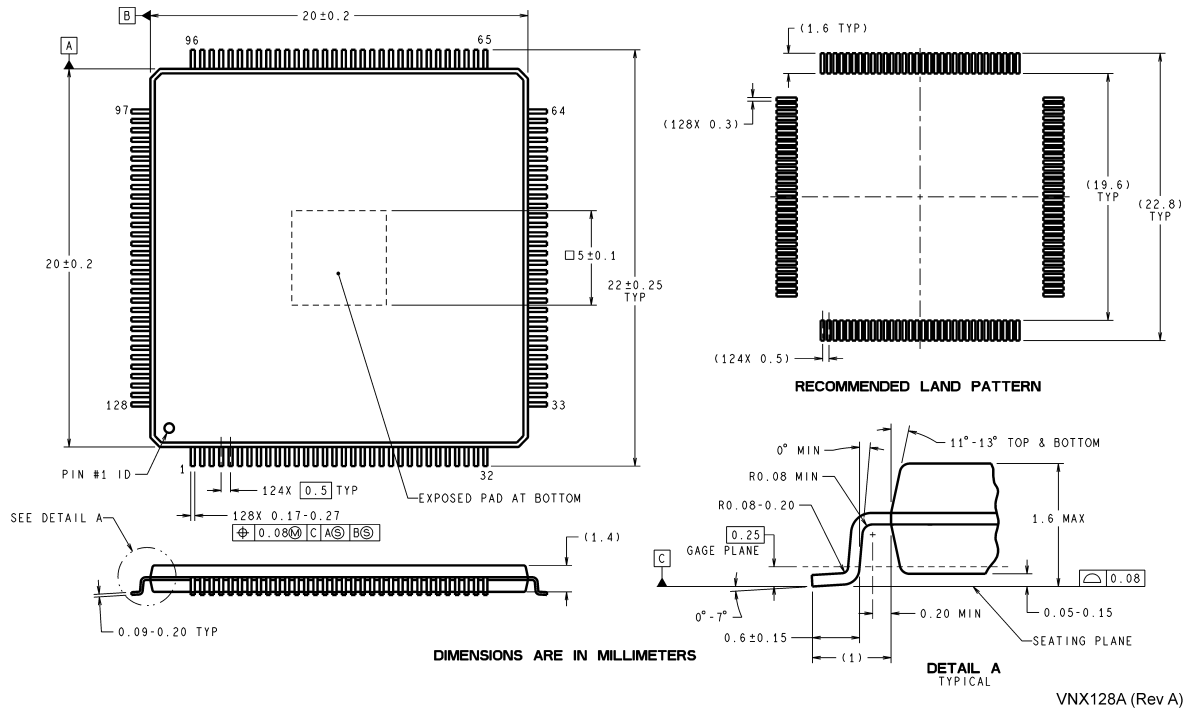
20068153

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





## Physical Dimensions inches (millimeters) unless otherwise noted



NOTES: UNLESS OTHERWISE SPECIFIED

REFERENCE JEDEC REGISTRATION MS-026, VARIATION BFB.

24-Lead Package TC  
Order Number ADC081000CMT  
NS Package Number VNX128A

## LIFE SUPPORT POLICY

NATIONAL'S PRODUCTS ARE NOT AUTHORIZED FOR USE AS CRITICAL COMPONENTS IN LIFE SUPPORT DEVICES OR SYSTEMS WITHOUT THE EXPRESS WRITTEN APPROVAL OF THE PRESIDENT AND GENERAL COUNSEL OF NATIONAL SEMICONDUCTOR CORPORATION. As used herein:

1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body, or (b) support or sustain life, and whose failure to perform when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in a significant injury to the user.
2. A critical component is any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.

## BANNED SUBSTANCE COMPLIANCE

National Semiconductor certifies that the products and packing materials meet the provisions of the Customer Products Stewardship Specification (CSP-9-111C2) and the Banned Substances and Materials of Interest Specification (CSP-9-111S2) and contain no "Banned Substances" as defined in CSP-9-111S2.



National Semiconductor  
Americas Customer  
Support Center  
Email: new.feedback@nsc.com  
Tel: 1-800-272-9959

www.national.com

National Semiconductor  
Europe Customer Support Center  
Fax: +49 (0) 180-530 85 86  
Email: europe.support@nsc.com  
Deutsch Tel: +49 (0) 69 9508 6208  
English Tel: +44 (0) 870 24 0 2171  
Français Tel: +33 (0) 1 41 91 8790

National Semiconductor  
Asia Pacific Customer  
Support Center  
Email: ap.support@nsc.com

National Semiconductor  
Japan Customer Support Center  
Fax: 81-3-5639-7507  
Email: jpn.feedback@nsc.com  
Tel: 81-3-5639-7560