ADVANCE DATASHEET



# LinearDimensions

## IP Block:LNDADC14 <4uA 14 Bit Pipeline ADC

TM

PHYSIOsensi

with nanoPower Technology

#### **GENERAL DESCRIPTION**

The LNDADC14 is a very low current (typical 3.5uA in 14 bit mode and 2.7uA in 10 bit mode) analog to digital converter developed for low bandwidth battery operated portable electronics applications. The LNDADC14 uses the latest techniques in low current data converter design. These newly derived techniques obsolete many of the existing low current implementations with respect to their power per conversation figure of merit (FOM).

The LNDADC14 operates from 2.7 to 3.6V Vin and operates at a 2.5kHz clock rate. The LDSADC12 features a user settable resolution from 8 to 14 bits to optimize power savings (for example a signal may be sampled at 8 bits until a desired signal is found to be present and then the resolution improved to 14 bits to improve feature accuracy at the price of current consumption for a period of time).

The LNDADC14 utilizes a 1.5 bit self correcting and fully differential internal analysis engine making it extremely tolerant to noise, battery glitches, and comparator metastability. An example of this self correcting capability is shown in Figure 1 (this is an 8 bit example).

For extremely low current applications of limited bandwidth (<1uA) the LNDADC14 may be utilized in a wakeup and sleep mode due to its fast startup time. The LNDADC14 utilizes <100nA of current in sleep mode.

The LNDADC14 features an ENOB of >12 in 14 bit mode and >9 in 10 bit mode, an INL of +/-0.65 LSB and DNL of +/-0.45 LSB.

### SELF CORRECTING EXAMPLE



**Figure 1** – Self correcting behavior (here shown for 8 bit operation) of the 1.5 bit quantizer illustrates the robustness of the LNDADC14 to noise or comparator metastability errors

#### FEATURES

- 2.7 to 3.6Vin operation
- 0 to 3.6V dynamic range
- 3.5uA typical current (14 bit sampling)
- 2.7uA typical current (10 bit sampling)
- 1.5 bit quantizer
- Self correcting architecture
- Eight (8) through fourteen (14) bit user adjustable operation to save power
- Fast startup (<100us)
- <100nA in sleep mode</li>
- Operates from as little as 2.7V Vin
- 2.5kHz minimum sampling rate
- >12 ENOB (14 bit operation)
- DNL +/-0.45, INL +/-0.65
- SPI Interface (independently enabled)

## **SELF CORRECTING 1.5 BIT QUANTIZER**



#### APPLICATIONS

- Portable heart rate equipment
- Portable fitness & wellness products
- Non-critical diagnostics
- Low bandwidth portable electronics

#### **EXAMPLE WAVEFORMS**

