10-Bit 1MSPS 0.18µm Analog-to-Digital Converter IP nAD1001-18

FEATURES

- 1.8V power supply
- SNR typ 58dB for \( f_{in} = 10\text{kHz} \)
- Scaleable low power (2mW @ 1.8V and 1MSPS)
- Compact area (<0.2mm²)
- Sampling frequency from 100kHz to 1MHz
- Programmable resolution. 6, 8, 10 and 12 bits
- 9 multiplexed single ended inputs
- Low input capacitance
- Three power saving idle modes

APPLICATIONS

- Instrumentation
- Wireless communication

GENERAL DESCRIPTION

The nAD1001-18 is a compact, high-speed, low power 6 to 12 bit monolithic analog-to-digital converter, implemented in a 0.18µm single poly CMOS process with MiM capacitor option. The converter includes a sample and hold. Using internal references, the full scale range is 1.2V with an input signal range of 0 to 1.2V. The full scale range can be set between 0.75V and 1.5V using external references. It operates from a single 1.8V supply. The bias current level for the ADC can be programmed in 8 steps. Hence, the power dissipation of the device can be minimised for the current operation frequency.

The nAD1001-18 has an algorithmic architecture - resulting in low silicon area. The core occupies less than 0.2mm² of die area in a standard single poly 0.18µm CMOS process with MiM capacitor option. The fully differential architecture makes it insensitive to substrate noise. Thus it is ideal as a mixed signal ASIC macro cell.

QUICK REFERENCE DATA

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Parameter</th>
<th>Conditions</th>
<th>Min.</th>
<th>Typ.</th>
<th>Max.</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>( V_{DD} )</td>
<td>Supply voltage</td>
<td></td>
<td>1.6</td>
<td>1.8</td>
<td>2.0</td>
<td>V</td>
</tr>
<tr>
<td>( P_D )</td>
<td>Power dissipation (1 MSPS)</td>
<td>Except digital output drivers</td>
<td>2</td>
<td>±0.5</td>
<td></td>
<td>mW</td>
</tr>
<tr>
<td>DNL</td>
<td>Differential nonlinearity ( f_{IN}=0.9\text{kHz} )</td>
<td></td>
<td>53</td>
<td>58</td>
<td>65</td>
<td>dB</td>
</tr>
<tr>
<td>INL</td>
<td>Integral nonlinearity ( f_{IN}=0.9\text{kHz} )</td>
<td></td>
<td>58</td>
<td>58</td>
<td>65</td>
<td>dB</td>
</tr>
<tr>
<td>SNR</td>
<td>Signal to noise ratio ( f_{IN}=10\text{kHz} )</td>
<td></td>
<td>53</td>
<td>58</td>
<td>65</td>
<td>dB</td>
</tr>
<tr>
<td>SFDR</td>
<td>Spurious free dynamic range ( f_{IN}=10\text{kHz} )</td>
<td></td>
<td>53</td>
<td>58</td>
<td>65</td>
<td>dB</td>
</tr>
</tbody>
</table>

Table 1: Quick reference data
nAD1001-18: 10 Bit 1 MSPS 0.18 µm ADC IP

DESIGN CENTER

Nordic VLSI ASA
Vestre Rosten 81
N-7075 TILLER
NORWAY
Telephone: +47 72898900
Telefax: +47 72898989

E-mail: For further information regarding our state of the art data converters, please e-mail us at datacon@nvlsi.no.


ORDERING INFORMATION

<table>
<thead>
<tr>
<th>Type number</th>
<th>Description</th>
<th>Price</th>
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</thead>
<tbody>
<tr>
<td>nAD1001-18-IC</td>
<td>nAD1001-18 sample in SSOP28 package</td>
<td>USD 50</td>
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<tr>
<td></td>
<td>(limited availability)</td>
<td></td>
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<tr>
<td>nAD1001-18-EVB</td>
<td>nAD1001-18 evaluation board including</td>
<td>USD 300</td>
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<td></td>
<td>characterisation report and user guide</td>
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</tbody>
</table>

Table 6: Ordering information

Objective Product Specification. Revision Date: January 2nd, 2003

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