

# Analog Standard Cell DAC8 – 8-Bit Digital to Analog Converter

DATA SHEET

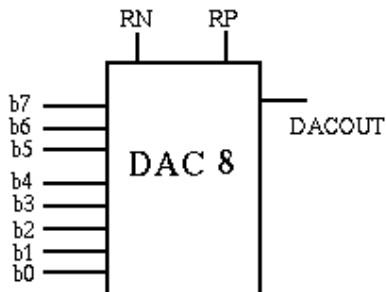
## Process

CUE (0.6µm)

## Key Features

- Full 8-Bit Resolution and Linearity
- Small Area 0.044 mm<sup>2</sup>;
- Size x = 216µm, y = 202µm
- Supply Voltage 5V ± 10%
- Only Single Power Supply Required

## Symbol



## General Description

This Macro Cell is an 8-Bit digital to analog converter.

## Functional Description

The architecture is based on two resistor dividers. Because of its high output impedance, which is also code dependent, it must be used together with a low offset operational amplifier at the output (e.g. OP03B). VRN and VRP must be within the common mode range of the opamp (e.g. between 1.5V and 3.5V).

## Pinlist

Pin	Description	Cap.
RP	Positive Reference Voltage	
RN	Negative Reference Voltage	
DACOUT	Analog Output	
b<7:0	Data Input b(0) = LSB	

## POWER SUPPLIES

The converter requires one power supply (vdda, gnd).

## TECHNICAL DATA FOR 5V SUPPLY

( $T_{\text{junction}} = 0$  to  $+85^{\circ}\text{C}$ ,  $V_{\text{DDA}} = 5\text{V} \pm 10\%$ , unless otherwise specified)

## GENERAL PARAMETERS

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
	Resolution		8			Bit
V <sub>in</sub>	Input Voltage Range		V <sub>SS</sub>		V <sub>DD</sub>	V
DNL	Differential Nonlinearity	VRP = 3.5V VRN = 1.5V VDD = 5V temp = 25°C		± 0.25		LSB
INL	Integral Nonlinearity	VRP = 3.5V VRN = 1.5V VDD = 5V temp = 25°C		± 0.25		LSB
V <sub>os</sub>	Input Offset Voltage	VRP = 3.5V VRN = 1.5V VDD = 5V temp = 25°C		± 0.25		LSB
R <sub>ref</sub>	Reference Impedance		5.9	8	10.7	kOhms
V <sub>dd</sub>	Power Supply Range		4.5	5.0	5.5	V
I <sub>dd</sub>	Power Supply Current			0.13 <sup>1)</sup>		mA
PV <sub>dd</sub>	Power Consumption			0.13 <sup>1)</sup>		mW
R <sub>out</sub>	Output Resistance			21 <sup>2)</sup>		kOhms

<sup>1)</sup> V<sub>refp</sub> - V<sub>refn</sub> = 1V

<sup>2)</sup> Middle of the resistor string; Code: 0111 0111

(output resistance is code-dependent)

I<sub>dd</sub> includes the current through the resistor string

## TRANSIENT PARAMETERS

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
T <sub>s</sub>	Settling Time	5V, 25°C C <sub>load</sub> = 30pF	<1			μs

$$V_{\text{out}} = (V_{\text{RP}} - V_{\text{RN}}) / 256 * \text{code}_{\text{in}} + V_{\text{RN}}$$

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