

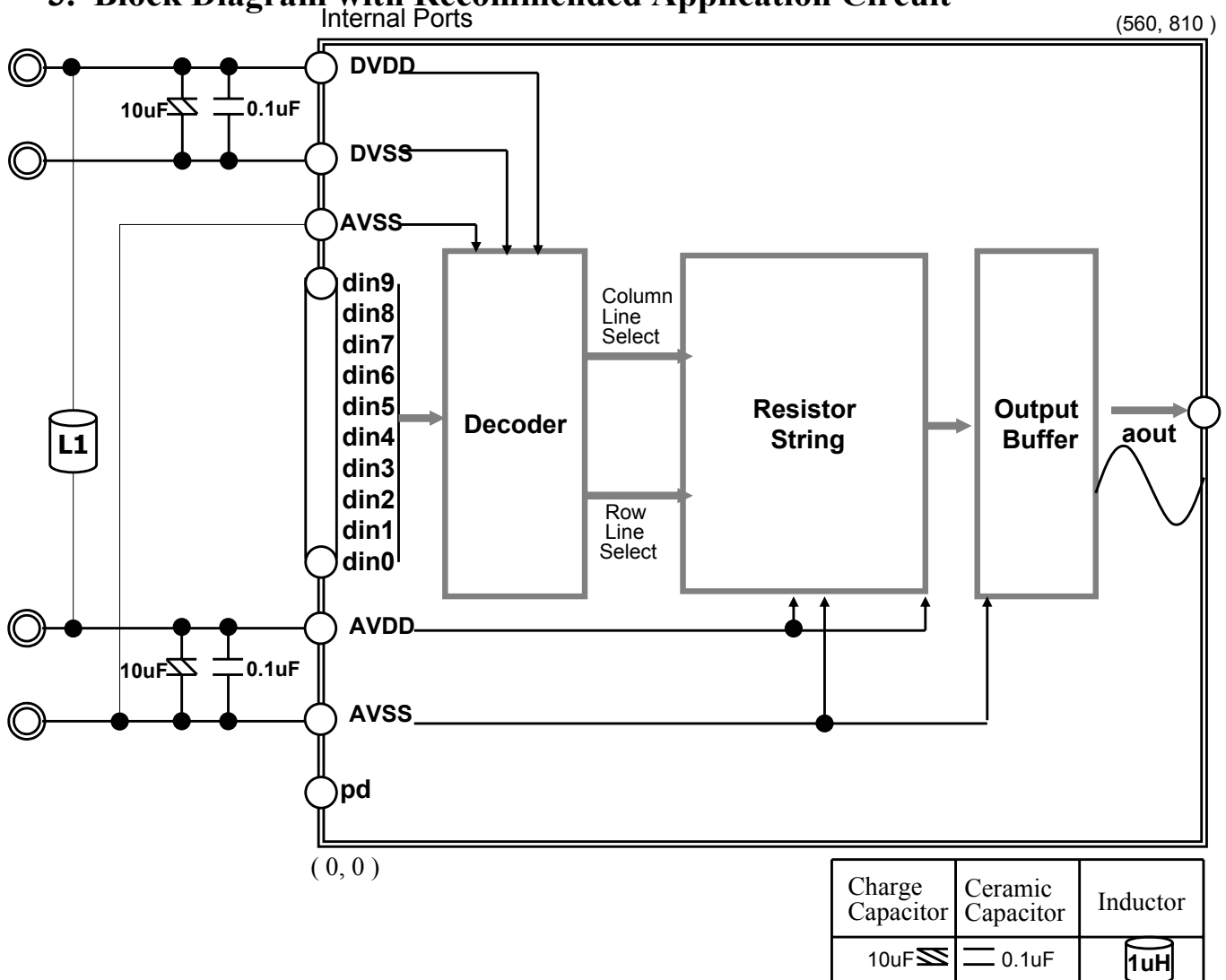
1. General Description

The H18GDA22S is a CMOS (0.18 μ m, 1-poly, 3-metal) 10-bit DAC(Digital-to-Analog converter) for industry. This DAC cell adapts resistor string method which enables simple implementation. This DAC offers low speed (1MHz), low power consumption. DAC is used for DVD_Player, Audio, and other Control systems.

2. Features

- Resistor string type
- Resolution : 10-bit
- Conversion rate : 1Msps
- Power supply : 1.8 V
- Power dissipation : 10mW (@1MHz)
- Process : 0.18 μ m CMOS generic Process (1-poly, 3-metal)
- Cell Size : 560 μ m \times 810 μ m(with guard ring)

3. Block Diagram with Recommended Application Circuit



4. Pin Descriptions

Name	Type	Description
AVDD	Power	Analog Power
AVSS	Ground	Analog Ground
DVDD	Power	Digital Power
DVSS	Ground	Digital Ground
din[0]	Input	Digital Input[LSB]
din[1]	Input	Digital Input
din[2]	Input	Digital Input
din[3]	Input	Digital Input
din[4]	Input	Digital Input
din[5]	Input	Digital Input
din[6]	Input	Digital Input
din[7]	Input	Digital Input
din[8]	Input	Digital Input
din[9]	Input	Digital Input[MSB]
pd	Input	Power down switch
aout	Output	Analog Output Signal

5. Function Descriptions

Normal Operation

When the input digital(din[9:0]) is applied, the decoder produces column line bit and row line bit. The column/row line bit selects one voltage point and the selected voltage level produces the output voltage through the output buffer. The range of output voltage is 0.4v ~ 1.6v.

Power down operation

To minimize power consumption, a power-down mode is provided. For power down, an external high signal is applied to pd. In the power-down mode, the average power consumption is reduced to $\geq 1\mu\text{A}$

6. Operating Conditions

Symbol	Parameter	Min.	Typ.	Max.	Unit
DVDD	Digital Power Supply	1.6	1.8	2.0	V
AVDD	Analog Power Supply	1.6	1.8	2.0	V
AVSS	Analog Ground	0	0	0	V
DVSS	Digital ground	0	0	0	V
T _{PWL}	Clock Pulse Width	0.5	-	-	us
T _{PWH}		0.5	-	-	
T _{OP}	Operating Temperature	0	25	100	°C

7. Electrical Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I _{dd}	Normal Operation	f _{con} =1MHz		5.5	6	mA
	Power Down Mode				≤1	uA
Accuracy	Resolution			10		bits
INL	Integral Nonlinearity	DC	-1.0		+1.0	LSB
DNL	Differential Nonlinearity	DC	-0.6		+0.6	LSB
SNR	Signal to Noise Ratio		50	54		dB
SNDR	Signal to Noise Distortion Ratio			55		dB
THD	Total Harmonic Distortion			60		dB
SFDR	Supurious Free Dynamic Range			55		dB
f _{con}	Conversion Speed			1		Msp/s
t _r /t _f	Analog Output Rise/Fall time	with ±10% Error		0.2		us
t _d	Analog Output Delay time			0.05		us
t _s	Analog Output Settling time			0.2		us
V _{OP-P}	Output Voltage Range	V _{ref} =3.3V	0.4	1.0	1.6	V

8. Timing Diagram

