

Overview of AD5110/AD5112/AD5114 Connections and Functionality

GENERAL DESCRIPTION

This quick start guide provides a general overview of AD5110/AD5112/AD5114 connections and functionality and should be reviewed in conjunction with the AD5110/AD5112/AD5114 data sheet.

FUNCTIONAL BLOCK DIAGRAM

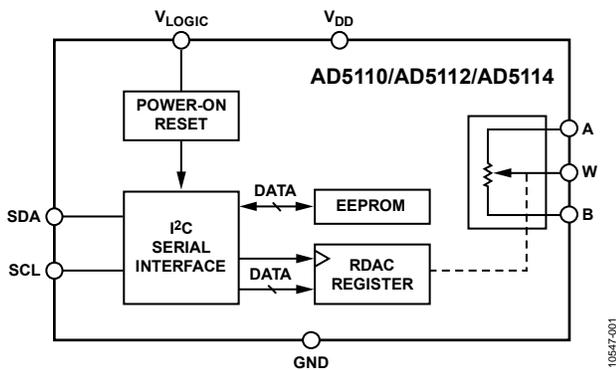
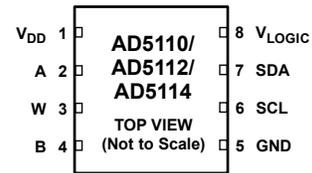


Figure 1.

10547-001

PIN CONFIGURATION



NOTES
1. THE EXPOSED PAD IS INTERNALLY FLOATING.

10547-002

Figure 2.

PIN FUNCTION DESCRIPTIONS

Table 1.

Pin No.	Mnemonic	Description
1	V _{DD}	Positive power supply.
2	A	Terminal A of RDAC.
3	W	Wiper terminal of RDAC.
4	B	Terminal B of RDAC.
5	GND	Ground pin.
6	SCL	Serial clock line.
7	SDA	Serial data line.
8	V _{LOGIC}	Logic power supply.
	EPAD	Internally floating exposed pad.

TYPICAL EXTERNAL CONNECTIONS

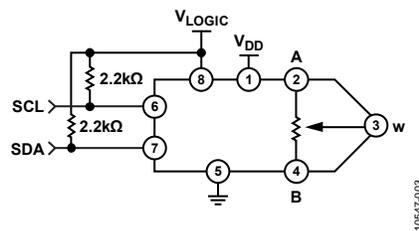
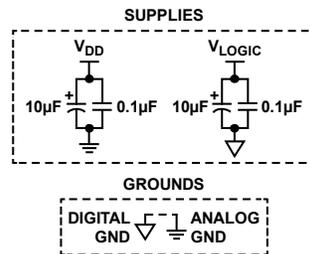


Figure 3.

10547-003

OPERATIONAL CONDITIONS

Table 2. Specifications

Parameter	Specification
V _{DD} to GND	2.3 V to 5.5 V
V _{LOGIC} to GND	1.8 V to V _{DD}
V _A , V _W , V _B to GND	GND to V _{DD}
Maximum Continuous I _A , I _W , I _B	
R _{AW} = 5 kΩ and 10 kΩ	±6 mA
R _{AW} = 80 kΩ	±1.5 mA
Maximum Clock (SCL)	400 kHz

Table 3. Device Address Selection

Model	7-Bit I ² C Device Address
AD511X ¹ BCPZ Y ²	0101111
AD511X ¹ BCPZ Y ² -1	0101100

¹ Model.

² Resistance.

SHIFT REGISTER AND TIMING DIAGRAM

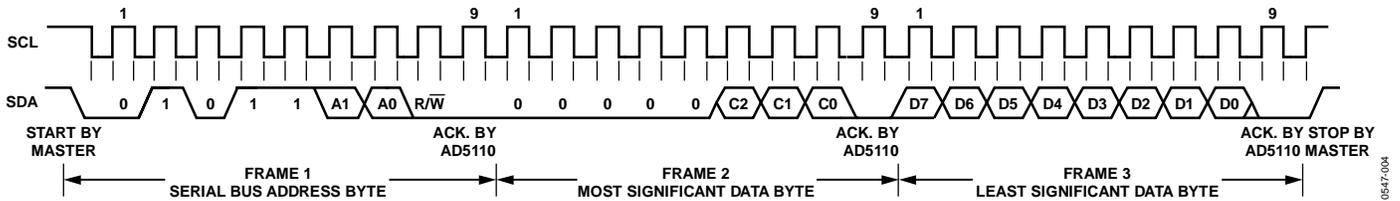


Figure 4. Write Sequence

COMMANDS

Table 4. Command Operation Truth Table

Command Number	Command			Data ¹								Operation		
	DB10	DB8	DB7	DB0										
	C2	C1	C0	D7	D6	D5	D4	D3	D2	D1	D0			
0	0	0	0	X	X	X	X	X	X	X	X	X	No operation	
1	0	0	1	X	X	X	X	X	X	X	X	X	Write contents of RDAC register to EEPROM	
2	0	1	0	0	6	5	4	3	2	1 ²	0 ^{2,3}	0 ^{2,3}	Write contents of serial register data to RDAC	
3	0	1	1	1	0	0	0	0	0	0	0	0	Top scale	
				1	1	1	1	1	1	1	1	1	Bottom scale	
				X	X	X	X	X	X	X	X	X	A0	Software shutdown
4	1	0	0	X	X	X	X	X	X	X	X	X	Shutdown off	
				X	X	X	X	X	X	X	X	X	Shutdown on	
				X	X	X	X	X	X	X	X	X	Software reset: refresh RDAC register with EEPROM	
5	1	0	1	X	X	X	X	X	X	X	X	Read contents of RDAC register		
6	1	1	0	X	X	X	X	X	X	A1	A0	Read contents of EEPROM		
												A1	A0	Data
												0	0	Wiper position saved
												0	1	Resistor tolerance

¹ X is a don't care.

² In the AD5114, this bit is a don't care.

³ In the AD5112, this bit is a don't care.

HOW TO CALCULATE THE ACTUAL END-TO-END RESISTANCE

For example, if $R_{AB} = 10 \text{ k}\Omega$ and the resistor tolerance data readback shows 01010010 (see Table 5), the end-to-end resistance can be calculated as:

DB[7]: 0 = negative (1 = positive)

DB[6:3]: 1010 = 10

DB[2:0]: 010 = $2 \times 2^{-3} = 0.25$

Then:

Tolerance = -10.25% and, therefore, $R_{AB} = 8.975 \text{ k}\Omega$.

Table 5. Resistor Tolerance Format

Data Byte								
DB7	DB6	DB5	DB4	DB3	.	DB2	DB1	DB0
Sign	2^4	2^3	2^2	2	.	2^{-1}	2^{-2}	2^{-3}

EXAMPLES**Table 6. Write the RDAC Register and Place the Wiper at Zero Scale**

Sequence	I ² C Address	Write RDAC Command	Zero Scale
Data	0x5E	0x02	0x00

Table 7. Readback the Wiper Position Saved

Sequence	I ² C Address	Write EEPROM Readback Command	Location		I ² C Address	Readback Data
Data	0x5E	0x06	0x00	Repeat start	0x5F	0xXX

NOTES

REVISION HISTORY

3/12—Revision 0: Initial Version



ESD Caution

ESD (electrostatic discharge) sensitive device. Charged devices and circuit boards can discharge without detection. Although this product features patented or proprietary protection circuitry, damage may occur on devices subjected to high energy ESD. Therefore, proper ESD precautions should be taken to avoid performance degradation or loss of functionality.

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