ANALOG DEVICES

AN-729
APPLICATION NOTE

One Technology Way • P.O. Box 9106 • Norwood, MA 02062-9106 • Tel: 781/329-4700 • Fax: 781/461-3113 • www.analog.com

Evaluation Kit for the AD5254 Quad 256-Position I²C-Compatible Nonvolatile Memory Digital Potentiometer

by Alan Li

5 STEPS TO SET UP THE EVALUATION KIT

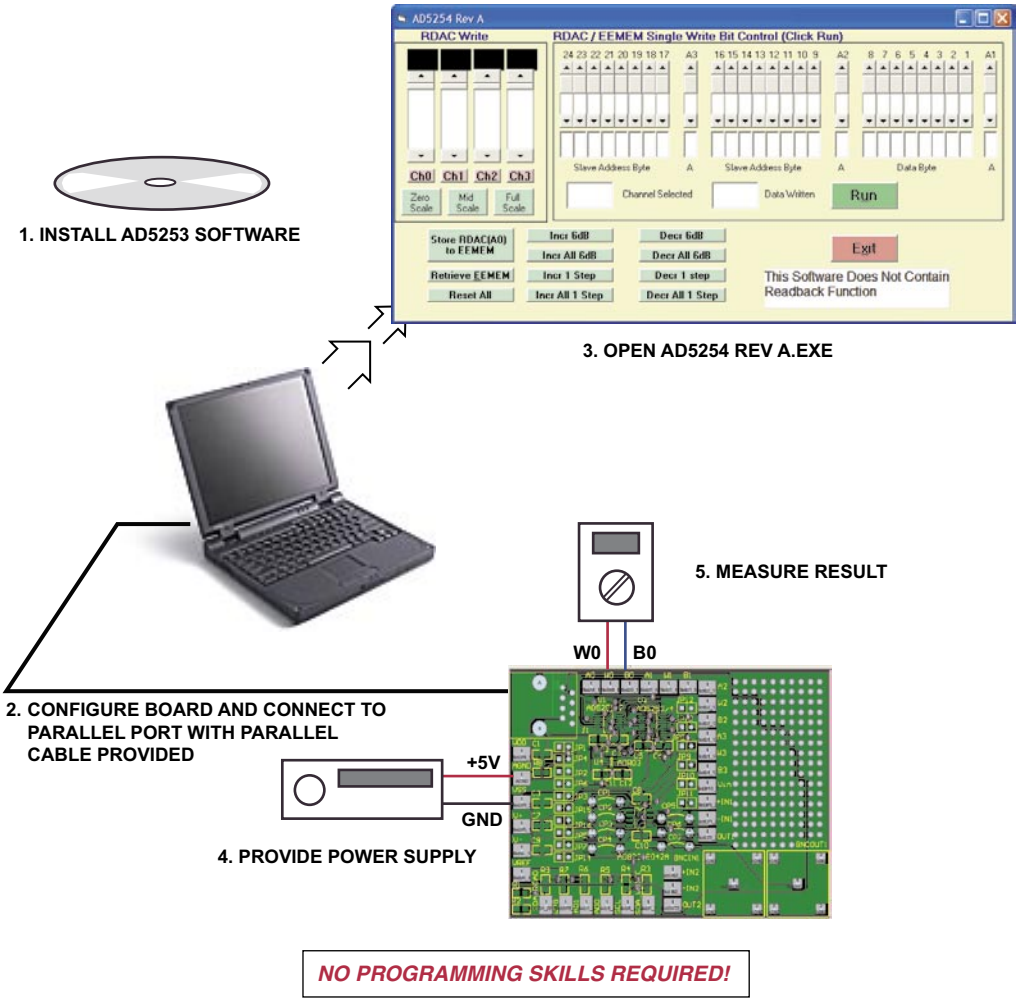


Figure 1. Evaluation Kit Setup

OPERATING THE AD5254 EVALUATION KIT

1. Click the Install Software link in the digital POT CD browser.
2. A 2-channel SO-8 op amp (such as AD822B) and a SC70 2.5 V reference (such as ADR03) are provided for common building block configurations, such as DAC, programmable gain amplifier, and programmable filter. See the Applications section for details.
3. Apply 5 V power supply to VDD and AGND terminals. Connect JP2 to ground VSS.
4. Connect the board to the parallel port with the connector and cable that are provided.
5. Open the AD5254 Rev. A program from the Windows® Start program. Move the scroll bar to program the resistance settings. The operation is self-explanatory.

Note: This Rev. B software is a beta version. The part is fully functional, but the Reading Function is not included in the software.

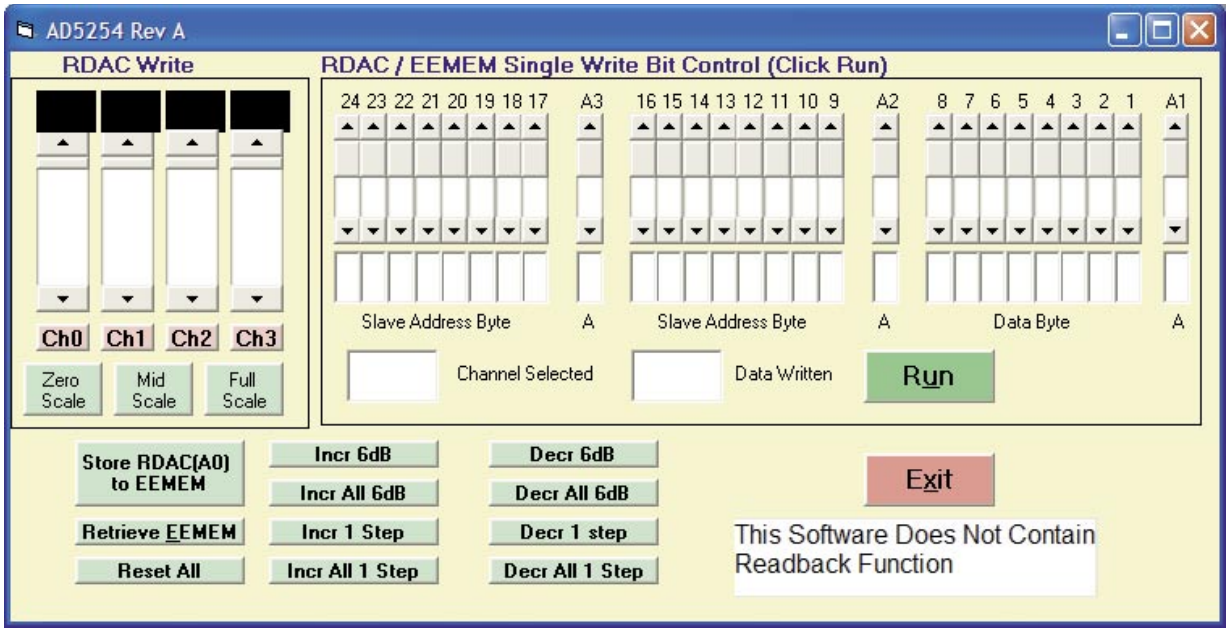


Figure 2. AD5254 Software Graphical Interface

AD5254 PARALLEL PORT CONNECTION

(For Visual Basic Program Developers Only)

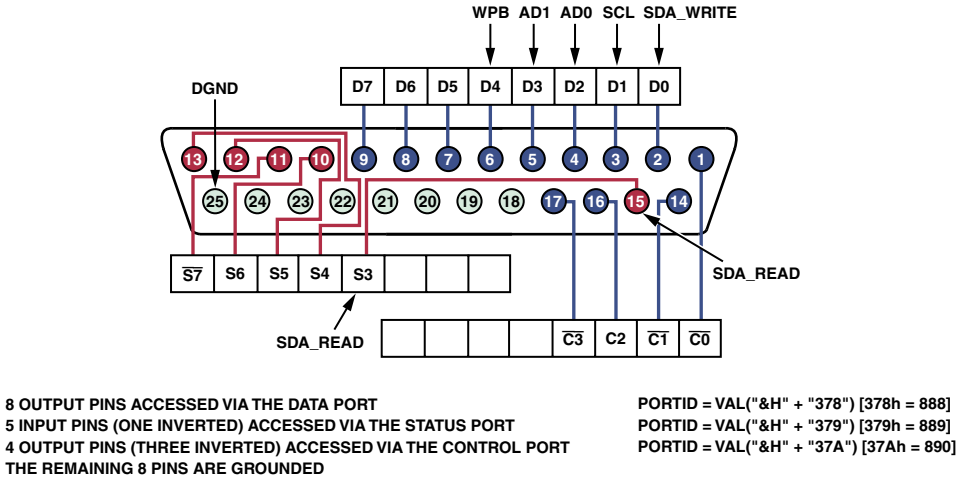


Figure 3. Parallel Port Connector Configuration (for VB Program Developers Only)

TIMING DEFINITION

(In Visual Basic Source Code cmdRUN)

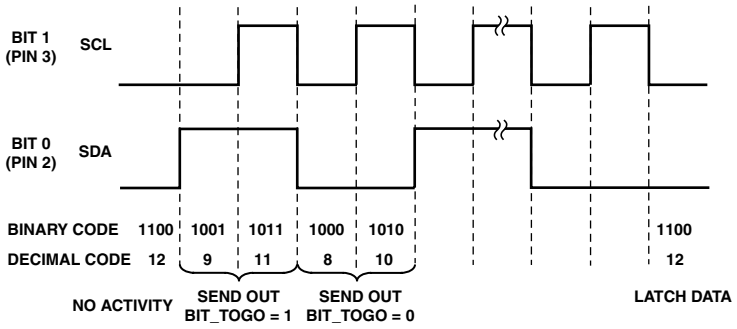


Figure 4. Timing Definition (for VB Program Developers Only)

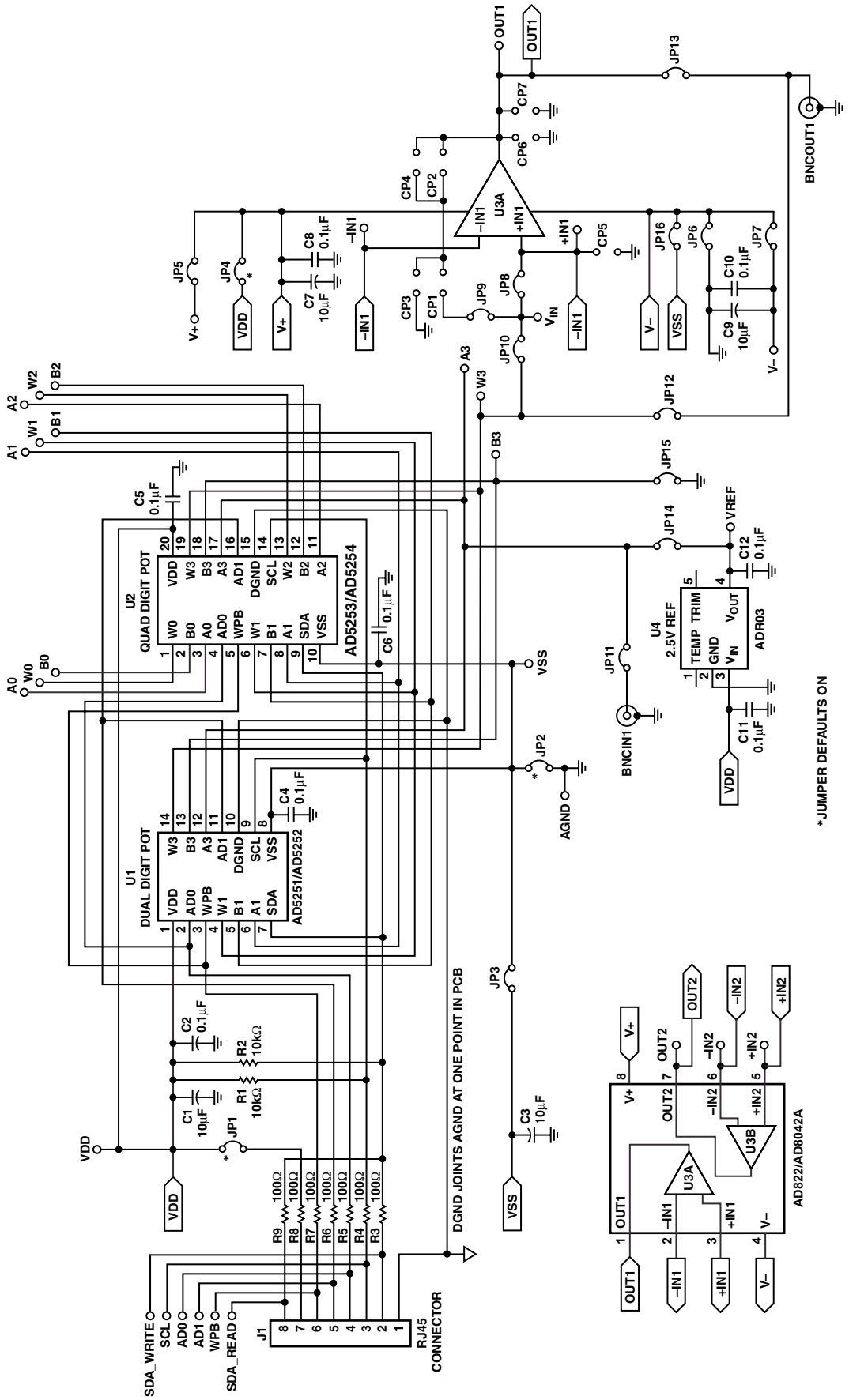


Figure 5. Evaluation Board Schematic

APPENDIX

Applications

The AD5254 evaluation board comes with dual op amp, AD822, and 2.5 V reference, ADR03. Users can configure various building block circuits with minimum components. Note that JP and CP stand for jumper and connection points, respectively, in the schematics.

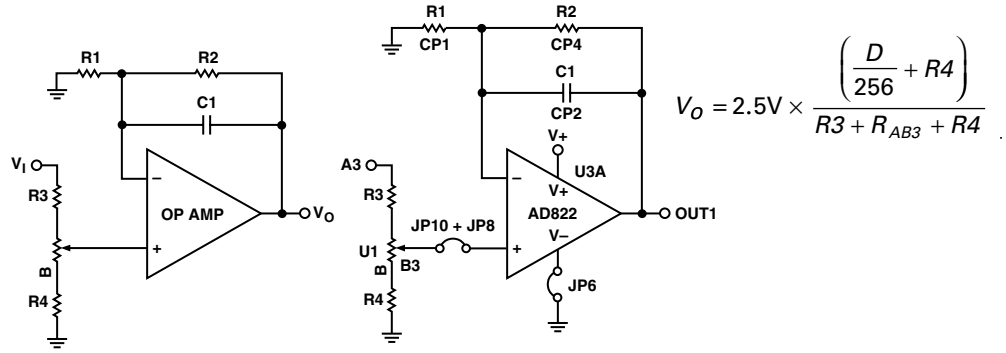


Figure 6. High Voltage Programmable Gain (for example, V_{COM} Adjustment)

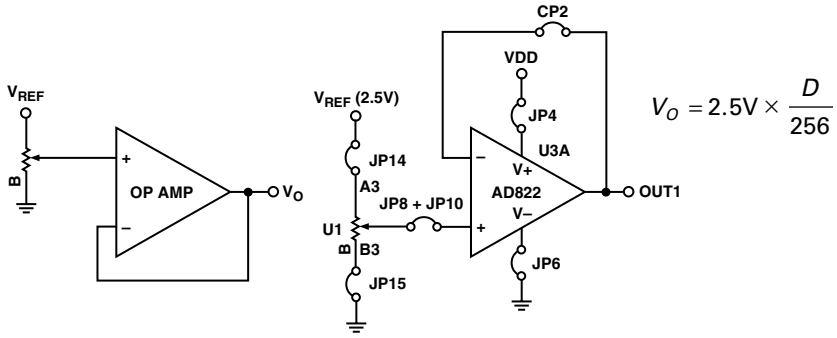


Figure 7. 8-Bit DAC

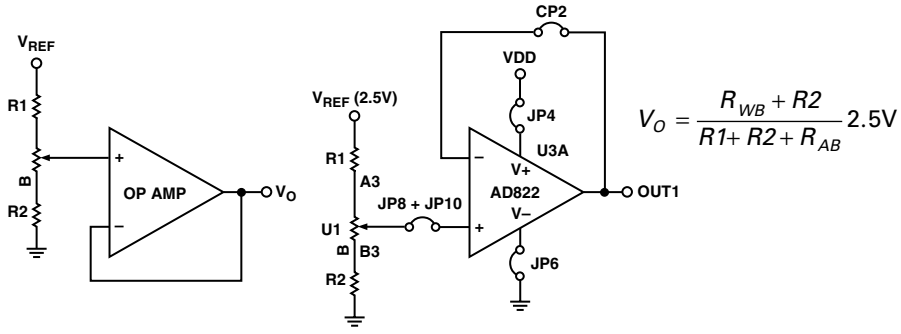


Figure 8. 8-Bit DAC with Floating References for Fine Adjustment

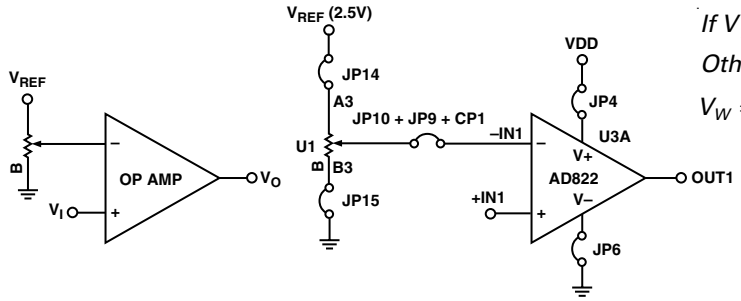


Figure 9. Level Detector

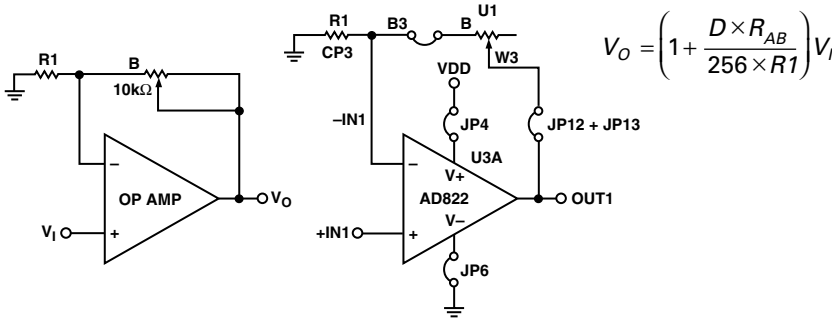


Figure 10. Noninverting Linear Gain

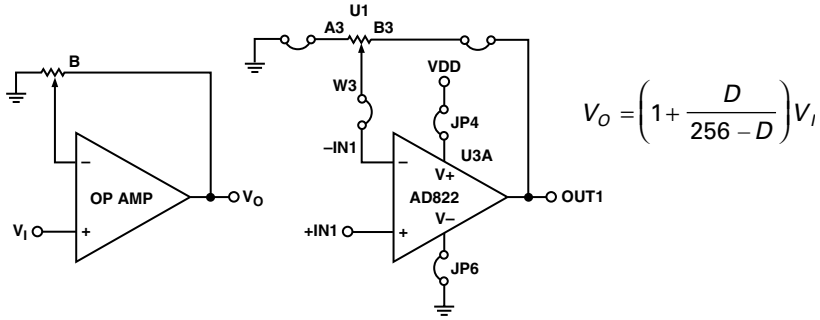
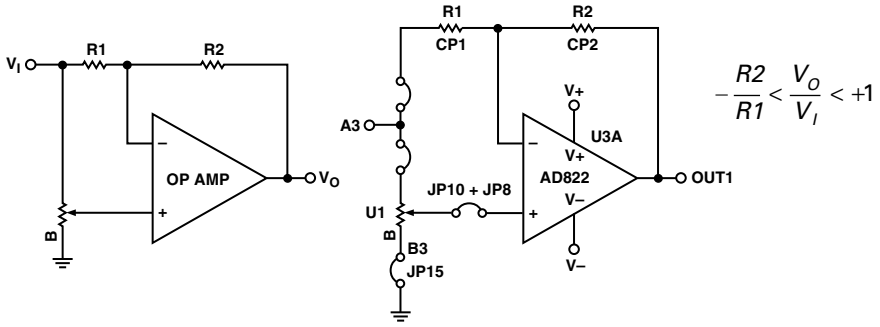
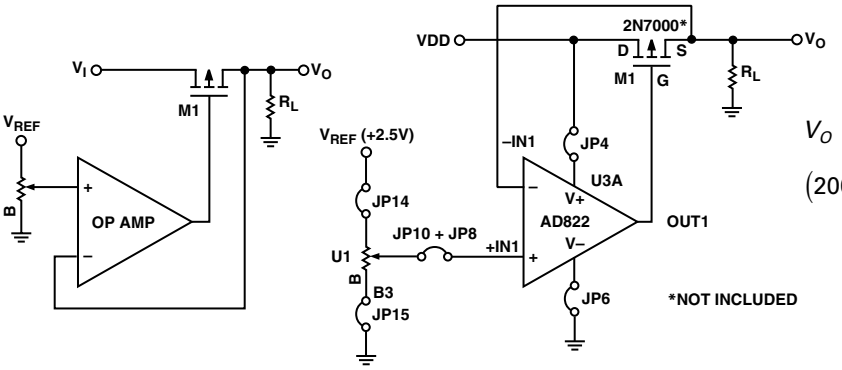


Figure 11. Pseudo Log Noninverting Gain



$$-\frac{R2}{R1} < \frac{V_O}{V_I} < +1$$

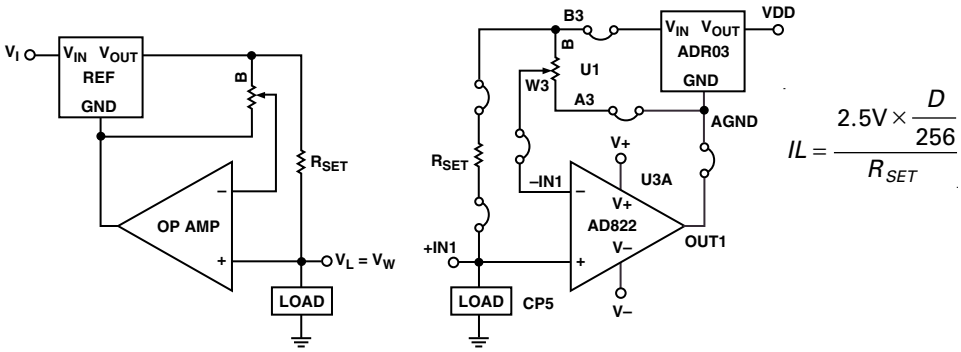
Figure 12. Bipolar Linear Gain



$$V_O = 2.5\text{V} \times \frac{D}{256}$$

$$(200\text{mA } max)$$

Figure 13. Programmable 2.5 V Power Supply



$$IL = \frac{2.5\text{V} \times \frac{D}{256}}{R_{SET}}$$

Figure 14. Programmable Current Source

PCB LAYOUT

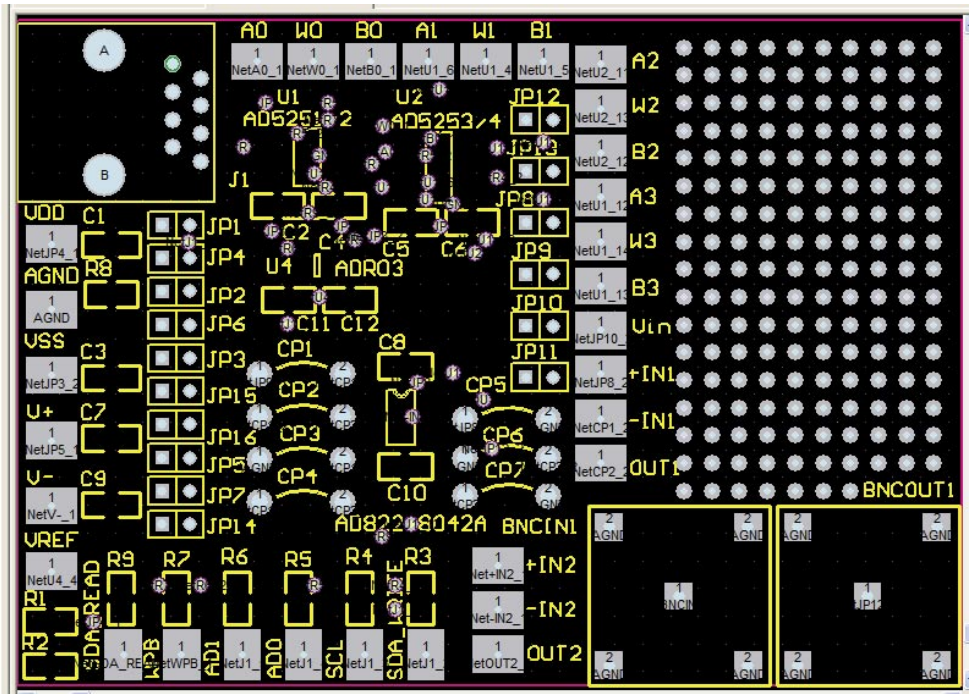


Figure 15. Evaluation Board

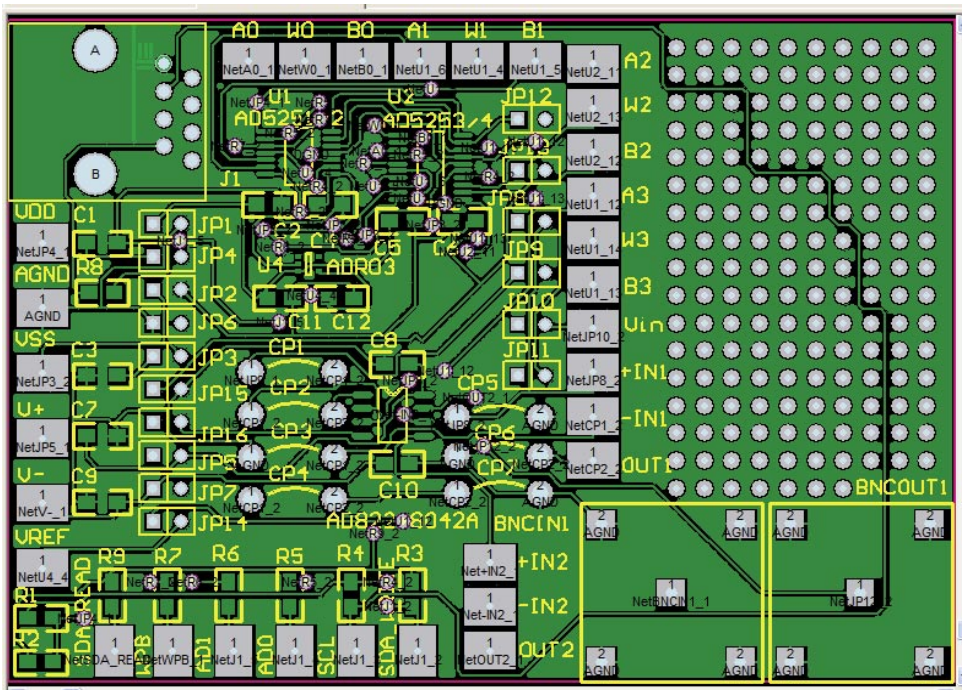


Figure 16. Top Overlay

Purchase of licensed I²C components of Analog Devices or one of its sublicensed Associated Companies conveys a license for the purchaser under the Philips I²C Patent Rights to use these components in an I²C system, provided that the system conforms to the I²C Standard Specification as defined by Philips.