1. Channel 1 Input Test: Current Sense Test
   1. Equipment
      1. LeCroy Digital Oscilliscope
      2. Discrete Line-Voltage H-N-G
      3. Fluke Multimeter
      4. CR Magnetics 8350-2500-N Current Transformer (2500:1)
   2. Setup
      1. Pass both Hot and Neutral wires through the current transformer
      2. Attach the multimeter, set to measure RMS voltage, to the leads coming from the current transformer.
      3. Attach a known load between the hot and neutral lines.
   3. Test plan
      1. Calculate IRMS and VRMS for the circuit created by the known load and the line-voltage.
      2. Calculate the average power applied to the known load.
      3. Calculate the expected values on the opposite side of the current transformer.
      4. Apply power to the circuit and measure, using the multimeter, the RMS voltage on the opposite side of the current transformer.
      5. Verify that the reading is within tolerances for the oscillioscope.
      6. Attach the CH1 probe of the oscilloscope to the output from the current transformer.
      7. Attach the CH2 probe of the oscilloscope to the terminals of the known load.
      8. Plot 1 period of both CH1 and CH2 on the same axis and measure the phase shift between the two signals.
2. Channel 2 Input Test: Voltage Sense Test
   1. Equipment:
      1. 2x255K ohm resistor 1% tolerance 1/8W
      2. 1x1K ohm resistor 1% tolerance 1/8W
      3. 33nF Capacitor 50V 10% tolerance
      4. 120/240V line voltage
      5. LeCroy Oscilloscope
      6. Tektronix Function Generator
   2. Test Setup:
      1. Assemble the input network as shown in Figure 4 of the Analogue Devices AN-564.
      2. Using the function generator, take data points, in log spacing, to generate a bode-plot for the response of the input network. All data should be captured in Microsoft Excel spreadsheets. Frequency sweep should range from approximately 1Hz up to a minimum of 1MHz; with signal amplitude of 10V.
      3. Attach line voltage to the input network.
      4. Ensure that the alligator clip of CH1 and CH2 probes are both connected to a common ground.
      5. Attach oscilloscope CH1 to the input side of the input network and oscilloscope CH2 to the output side of the input network.
      6. Measure the output against the input to affirm that the input network is functioning as expected and reducing the input voltage to approximately 470mV.
3. Analogue Devices ADE7756 Power Supply
   1. Equipment and Supplies
      1. Capacitor C1, 100 nF, 50V 10%
      2. Capacitor C2, 220 uF, 6.3V 20% (electrolytic)
      3. Capacitor C3, 330uF, 50V, 20%
      4. Inductor L1, Ferrite Bead
      5. Inductor L2, Ferrite Bead
      6. MOV1, Metal Oxide Varistors
      7. R2-R4, 00 Ohm, 1/8W 5%
      8. T1 Transformer, 10VCT, .110A
      9. VR1, 5V Regulator (7805)
      10. Z1, Bridge Rectifier, 1A 100V
      11. Fluke DMM
      12. LeCroy Digital Oscilloscope
      13. Soldering iron
      14. Known load (resistive)
      15. Known load (switching)
   2. Test setup
      1. Assemble the power supply as seen in figure 17 of the ADE7756 AN-564 on a breadboard. All connections to the left of the bridge rectifier MUST be soldered directly.
      2. Attach ferrite beads L1 and L2 to the hot line voltage.
      3. Power on the supply, visually inspecting for any faulty operation.
      4. Measure the voltage on both sides of the metal oxide varistor.
      5. Attach oscilloscope CH1 and CH2 to points 1 and 4 of the bridge rectifier.
      6. Validate that the bridge rectifier is functioning as expected.
      7. Measure the voltage, with reference to ground coming from the right side of the 7805-voltage regulator.
      8. Attach a known resistive load to the power supply, validate that the voltage remains steady.
      9. Attach a known resistive load to the power supply, validate that the current-draw does not exceed 0.110A.
      10. Attach a known switching load to the power supply, validate that the voltage remains at 5V steady.
      11. Attach a known switching load to the power supply, validate that the current-draw does not exceed 0.110A.