

Signal Chain Power Input Connection Board

DESCRIPTION

Demonstration circuit SCP-INPUT-EVALZ is a companion hardware tool designed to allow external connections when building power systems. It will accept standard banana jacks and clip-lead type connectors to attach to power supplies and meters.

Like all boards in the Signal Chain Power series, this board is designed to be easily plugged into other SCP boards to form a complete signal chain power system, enabling fast evaluation of low power signal chains. To evaluate this board, some universal SCP hardware is required, namely:

| | |
|--------------------|--------------------|
| SCP-FILTER-EVALZ | SCP-OUTPUT-EVALZ |
| SCP-1X2BKOUT-EVALZ | SCP-1X5BKOUT-EVALZ |
| SCP-5X1-EVALZ | SCP-THRUBRD-EVALZ |

To properly evaluate SCP series demo boards, you will need the SCP Configurator companion software. SCP Configurator can help you choose the right board and topology for your design.

Design files for this circuit board are available.

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Table 1. Performance Summary

| SYMBOL | PARAMETER | NOTES | MIN | TYP | MAX | UNITS |
|----------------|---------------------------|---|-----|-----|-----|-------|
| $V_{IN(MAX)}$ | Max Input Voltage | | | | 250 | V |
| $V_{OUT(MAX)}$ | Max Output Voltage | Output Capacitor Rating Limited Replace for higher V_{OUT} | | | 250 | V |
| $I_{OUT(MAX)}$ | Max Output Current | | | | 3 | A |
| $I_{LED(MAX)}$ | Max Indicator LED Current | See Configuration Section | | | 30 | mA |

BOARD IMAGE

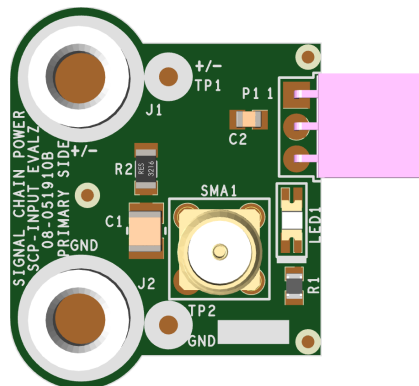


Figure 1. SCP-INPUT-EVALZ Board

QUICK START PROCEDURE

Demonstration circuit SCP-INPUT-EVALZ is easy to set up to evaluate the performance of any SCP hardware configuration.

1. The SCP-INPUT-EVALZ ships with a bi-directional LED to indicate applied voltage. To set the limiting resistor, see “Configuration Settings” section, and modify the board accordingly. Be sure to check for open connections or solder shorts after making any modifications.
2. Connect the SCP-INPUT-EVALZ and SCP-OUTPUT-EVALZ boards to the SCP board under evaluation (refer to Figure 2) and connect the input board to a voltage source, V_{SOURCE} . Connect the output board to a voltmeter or dynamic load. Slowly raise the input voltage until the SCP-INPUT-EVALZ powers up the device under test into regulation and sweep V_{SOURCE} through the desired range of operation.

NOTE: Make sure that the input voltage is always within spec. If using a dynamic load to measure output voltage, make sure the load is initially set to zero.

3. Check for proper output voltage. The output should be regulated at the programmed value ($\pm 5\%$).
4. Once the proper output voltage is established, power off V_{SOURCE} and similarly test other boards in the SCP system until all elements have been individually verified prior to assembling into the final circuit configuration.

NOTE: When measuring the input or output voltage ripple, use the optional SMA connector locations available on the input, output, 1×5 , 1×2 , and 5×1 breakout boards. Avoid using the test point connections with long scope leads.

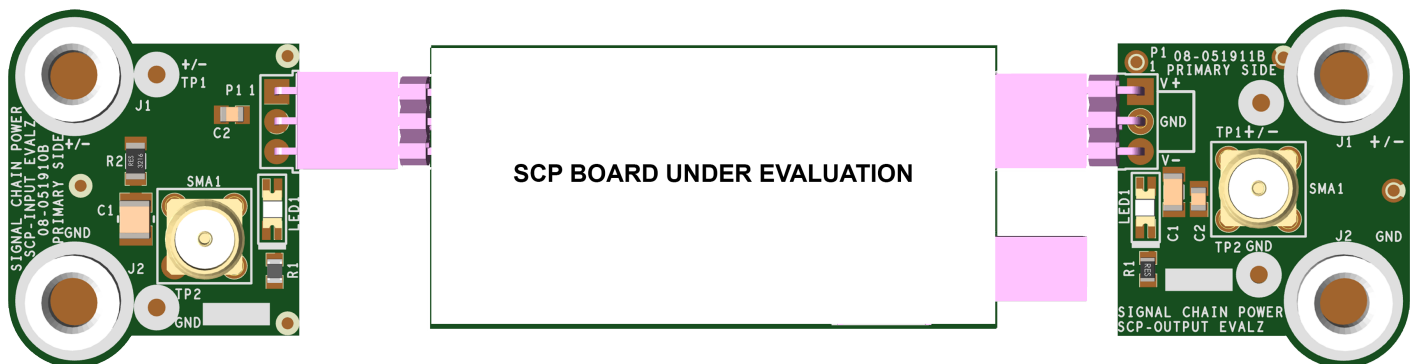


Figure 2. Proper Measurement Equipment Setup (Use SMA connectors for Measuring Input or Output Ripple)

CONFIGURATION SETTINGS

Demonstration circuit SCP-INPUT-EVALZ is a companion hardware tool designed to allow external connections when building power systems. It will accept standard banana jacks and clip-lead type connectors to attach to power supplies and meters.

INDICATOR LED CURRENT

$$I_{LED} = \frac{V_{IN} - [2.00V_{MIN}; 2.40V_{MAX}]}{R_1}$$

Table 2. LED Current-Limiting Resistor Selection Table

| V _{IN} (V) | R1 (Ω) | V _{IN} (V) | R1 (Ω) |
|---------------------|--------|---------------------|--------|
| 2.5 | 24.9 | 23.0 | 1.05k |
| 3.0 | 49.9 | 24.0 | 1.10k |
| 3.3 | 9 | 25.0 | 1.15k |
| 3.5 | 75 | 26.0 | 1.21k |
| 4.0 | 100 | 27.0 | 1.24k |
| 4.5 | 124 | 28.0 | 1.30k |
| 5.0 | 150 | 29.0 | 1.33k |
| 5.5 | 174 | 30.0 | 1.40k |
| 6.0 | 200 | 31.0 | 1.43k |
| 6.5 | 226 | 32.0 | 1.50k |
| 7.0 | 249 | 33.0 | 1.54k |
| 7.5 | 274 | 34.0 | 1.58k |
| 8.0 | 301 | 35.0 | 1.65k |
| 8.5 | 324 | 36.0 | 1.69k |
| 9.0 | 348 | 37.0 | 1.74k |
| 9.5 | 374 | 38.0 | 1.78k |
| 10.0 | 402 | 39.0 | 1.87k |
| 11.0 | 453 | 40.0 | 1.91k |
| 12.0 | 499 | 41.0 | 1.96k |
| 13.0 | 549 | 42.0 | 2.00k |
| 14.0 | 604 | 43.0 | 2.05k |
| 15.0 | 649 | 44.0 | 2.10k |
| 16.0 | 698 | 45.0 | 2.15k |
| 17.0 | 750 | 46.0 | 2.21k |
| 18.0 | 806 | 47.0 | 2.26k |
| 19.0 | 845 | 48.0 | 2.32k |
| 20.0 | 909 | 49.0 | 2.37k |
| 21.0 | 953 | 50.0V | 2.43k |
| 22.0 | 1.00k | | |

SIGNAL MEASUREMENT CONFIGURATION

The input has a vertical SMA output connector for easy connection to test or measurement equipment. It can also be used to carry power into the system in a coaxial environment, if desired. Additionally, the banana jacks are spaced at 0.750" for use with BNC (female) to double stacking banana plug type adapters (Pomona model 1269 or equivalent). The spacing also allows for close connection to power supplies with this standard.

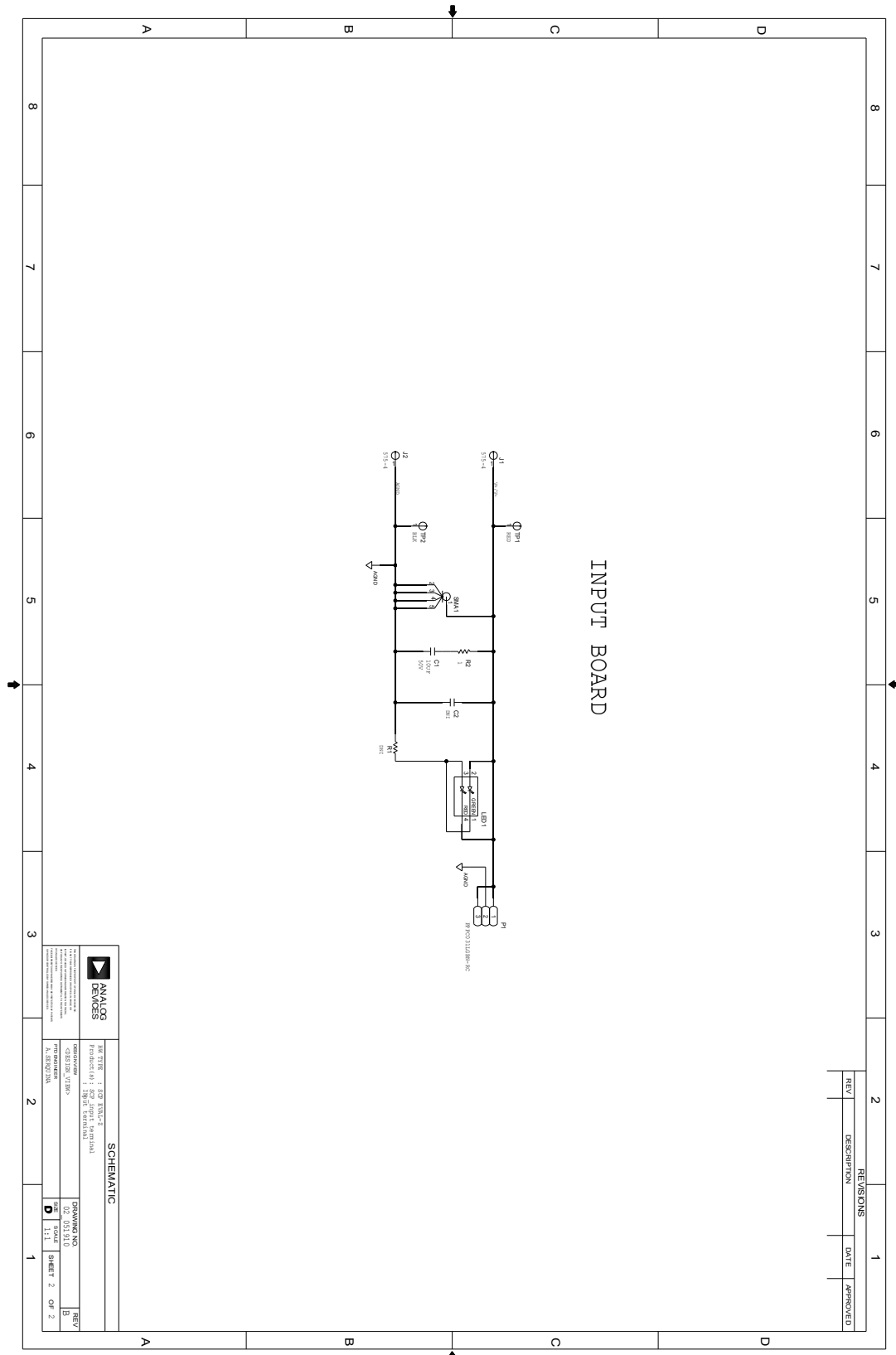
DEMO MANUAL SCP-INPUT-EVALZ

PARTS LIST

| ITEM | QTY | REFERENCE | PART DESCRIPTION | MANUFACTURER/PART NUMBER |
|------|-----|-----------|------------------------------------|------------------------------------|
| 1 | 1 | PCB | PCB | ANALOG DEVICES 08_051910b |
| 2 | 1 | C1 | CAP 10uF 50V CER X5R | SAMSUNG CL31A106MBHNNNE |
| 3 | 1 | C2 | CAP MLCC 0805 (Note 1) | N/A |
| 4 | 2 | J1, J2 | CONN-PCB BANANA JACK | KEYSTONE ELECTRONICS 575-4 |
| 5 | 1 | LED1 | LED BI-COLOR GREEN/RED | LITE-ON TECHNOLOGY LTST-C235KGKRKT |
| 6 | 1 | P1 | CONN FEMALE 3POS 2.54MM PITCH R/A | SULLINS PPPC031LGBN-RC |
| 7 | 1 | R1 | RES THICK FILM 0805 (Note 1) | N/A |
| 8 | 1 | R2 | RES 1R00 1% THICK FILM CHIP | PANASONIC ERJ-8RQF1R0V |
| 9 | 1 | SMA1 | CONN-PCB STRAIGHT SMA PCB DIE CAST | TE CONNECTIVITY LTD 5-1814832-1 |
| 10 | 1 | TP1 | CONN-PCB TEST POINT RED | KEYSTONE ELECTRONICS 10 |
| 11 | 1 | TP2 | CONN-PCB TEST POINT BLACK | KEYSTONE ELECTRONICS 5011 |

Note 1. These items are not stuffed (DNI).

SCHEMATIC DIAGRAM



DEMO MANUAL SCP-INPUT-EVALZ



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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