

Signal Chain Power LT1962 LDO Linear Regulator

DESCRIPTION

Demonstration circuit SCP-LT1962-EVALZ is a 20V, 300mA Low Dropout (LDO) regulator designed to allow low noise operation in noise sensitive circuits. It is easily configured for a wide output range and can provide extremely quiet operation with its high PSRR.

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-INPUT-EVALZ 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.

Note that this Demo Manual does not cover details important to the operation and configuration regarding the [LT1962](#). Please refer to the [LT1962 datasheet](#) for a complete description of the part.

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				20	V
$V_{OUT(MAX)}$	Max Output Voltage				19.57	V
$I_{OUT(MAX)}$	Max Output Current				300	mA

BOARD IMAGE

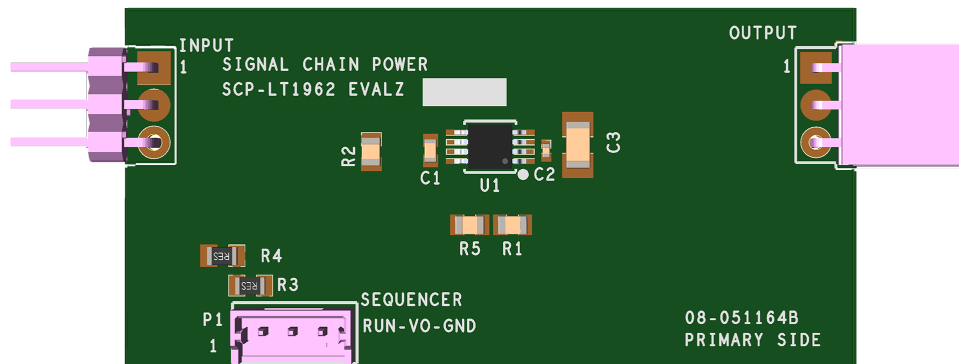


Figure 1. SCP-LT1962-EVALZ Board

QUICK START PROCEDURE

Demonstration circuit SCP-LT1962-EVALZ is easy to set up to evaluate the performance of any SCP hardware configuration.

1. The SCP-LT1962-EVALZ ships with a default output voltage of 3.3V. To change the output voltage, 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-LT1962-EVALZ (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-LT1962-EVALZ powers up 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.

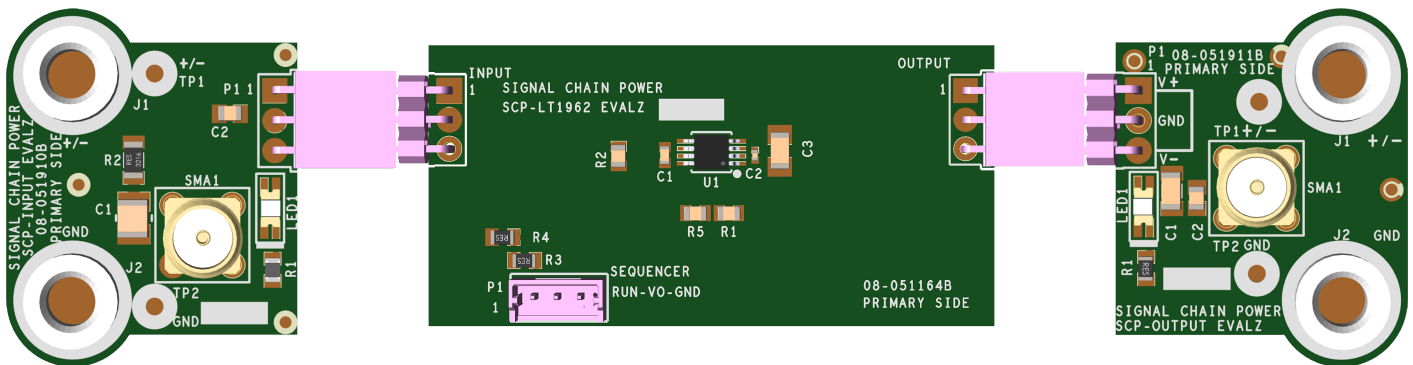


Figure 2. Proper Measurement Equipment Setup (Use SMA connectors for Measuring Input or Output Ripple)

CONFIGURATION SETTINGS

Demonstration circuit SCP-LT1962-EVALZ is a 20V, 300mA Low Dropout (LDO) regulator designed to allow low noise operation in noise sensitive circuits. It is easily configured for a wide output range and can provide extremely quiet operation with its high PSRR.

The output of the SCP-LT1962-EVALZ is resistor-programmable from 1.22V to 19.5V.

OUTPUT VOLTAGE PROGRAMMING

$$V_{OUT} = 1.22V \left(1 + \frac{R1}{R5} \right)$$

Table 2. Resistor Selection Guide for Common Output Voltages

V _{OUT} (V)	R1 (Ω)	R5 (Ω)
1.22	0	Open
1.25	1.02k	41.2k
1.5	11.5k	49.9k
1.8	26.1k	54.9k
2.0	13.7k	21.5k
2.5	57.6k	54.9k
3.0	20.0k	13.7k
3.5	49.9k	26.7k
4.0	23.2k	10.2k
4.5	30.9k	11.5k
5.0	31.6k	10.2k
5.5	25.7k	10.2k
6.0	90.9k	23.2k
6.5	174k	40.2k
7.0	64.9k	13.7k
7.5	137k	26.7k
8.0	59.0k	10.7k
8.5	63.4k	10.7k
9.0	137k	21.5k
9.5	169k	24.9k
10	76.8k	10.7k
11	150k	18.7k
12	205k	23.2k
13	133k	13.7k
14	110k	10.5k
15	340k	30.1k
16	464k	38.3k
17	102k	7.87k
18	158k	11.5k
19	200k	13.7k
19.5	102k	6.81k

SHDN PIN CONFIGURATION

The $\overline{\text{SHDN}}$ pin is tied to the optional SCP Run/Sequence header P1. To create a harness for this function, use Molex part 0510650300 with crimp pin 50212-8000.

To use an active run signal, use a 100k resistor for either pull-up or pull-down resistors R2 and R4, short R3 with 0Ω, and use the drive signal from connector P1.

The $\overline{\text{SHDN}}$ pin requires typically a μA source of current and the LT1962 cannot run if the pin is left open.

BYPASS PIN CONFIGURATION

The addition of a bypass capacitor lowers output noise considerably, while also increasing startup time. It also allows a lower capacitance to stabilize the loop response for a given output capacitor ESR. The default 0.01μF capacitor is recommended for most applications.

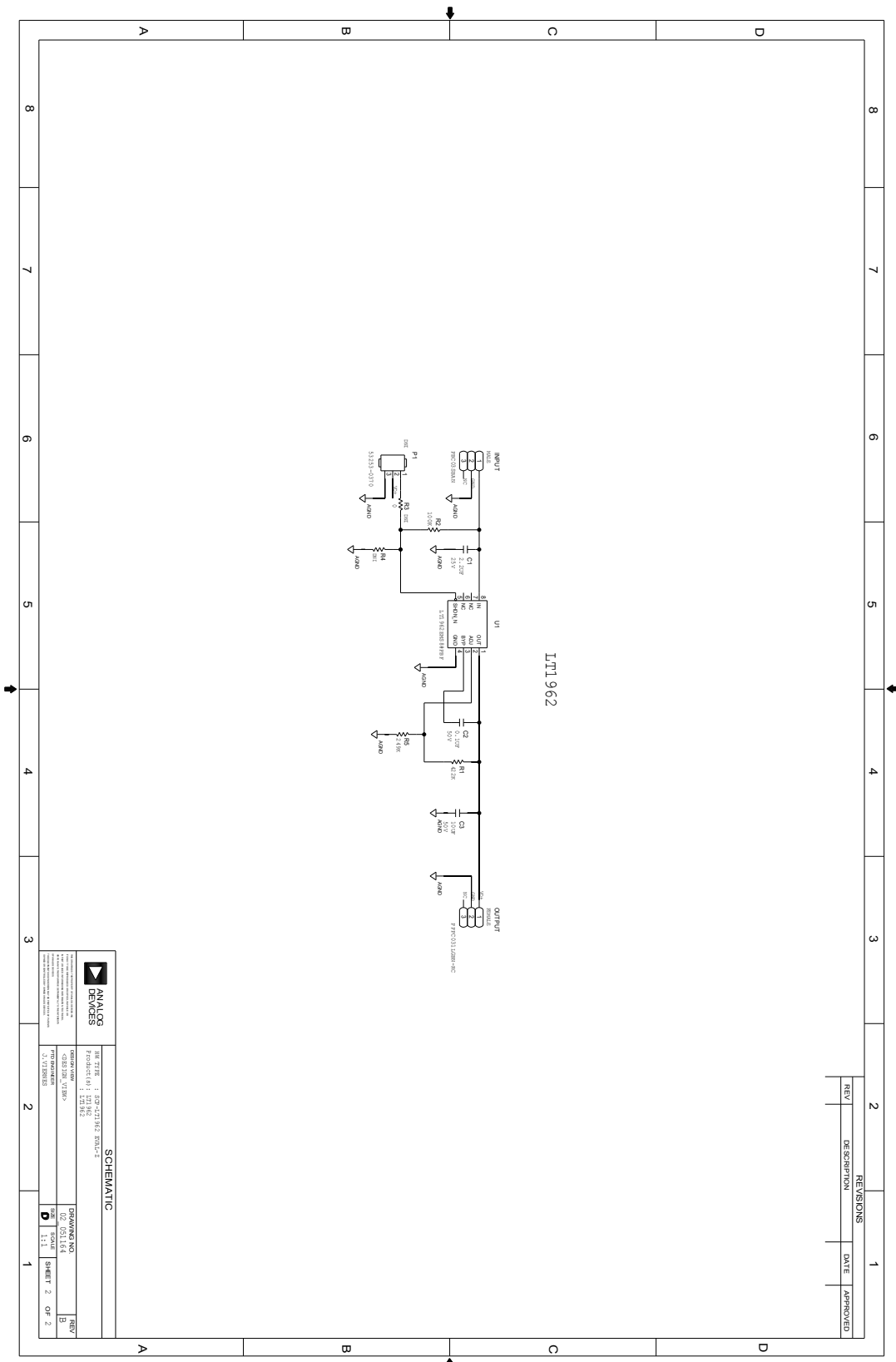
DEMO MANUAL SCP-LT1962-EVALZ

PARTS LIST

ITEM	QTY	REFERENCE	PART DESCRIPTION	MANUFACTURER/PART NUMBER
1	1	PCB	PCB	ANALOG DEVICES 08_051164b
2	1	C1	CAP 2.2uF 25V CER X5R 0603	MURATA GRM188R61E225KA12D
3	1	C2	CAP CER 0.1uF 50V CER X5R 0402	YAGEO CC0402KRX5R9BB104
4	1	C3	CAP CER 10uF 50V X5R 1206	SAMSUNG CL31A106MBHNNNE
5	1	INPUT	CONN MALE 3POS 2.54MM PITCH R/A	SULLINS PBC03SBAN
6	1	OUTPUT	CONN FEMALE 3POS 2.54MM PITCH R/A	SULLINS PPPC031LGBN-RC
7	1	P1	CONN-PCB 3POS HEADER WIRE TO BRD WAFER ASSY STRAIGHT 2MM PITCH (Note 1)	MOLEX 53253-0370
8	1	R1	RES 422k 1% THICK FILM 0805	YAGEO RC0805FR-07422KL
9	1	R2	RES 100k 1% THICK FILM 0805	PANASONIC ERJ-6ENF1003V
10	1	R3	RES THICK FILM 0805 (Note 1)	N/A
11	1	R4	RES THICK FILM 0805 (Note 1)	N/A
12	1	R5	RES 249k 1% THICK FILM 0805	VISHAY CRCW0805249KFKECC
13	1	U1	IC-LIN LOW NOISE, MICROPOWER LDO REGULATOR	ANALOG DEVICES LT1962EMS8#PBF

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

SCHEMATIC DIAGRAM



DEMO MANUAL SCP-LT1962-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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