Evaluating the ADL5960

FEATURES

- Full featured evaluation board for the ADL5960
- Integrated bi-directional bridge measures forward and reverse coupled signal

EQUIPMENT NEEDED

- Power Supply
- Signal Generator
- Spectrum Analyzer
- Linduino Board
- PC

GENERAL DESCRIPTION

Evaluation Board ADL5960-EVALZ allows evaluation of the ADL5960 network analyzer front end IC.

The ADL5960 with integrated bridge simultaneously measure forward and reverse signal coupled thru the bridge up to 20GHz. The integrated mixers down convert the RF input signal to IF measured at the output IF output ports.

SPI interface allows for programmable IF gain and bandwidth.

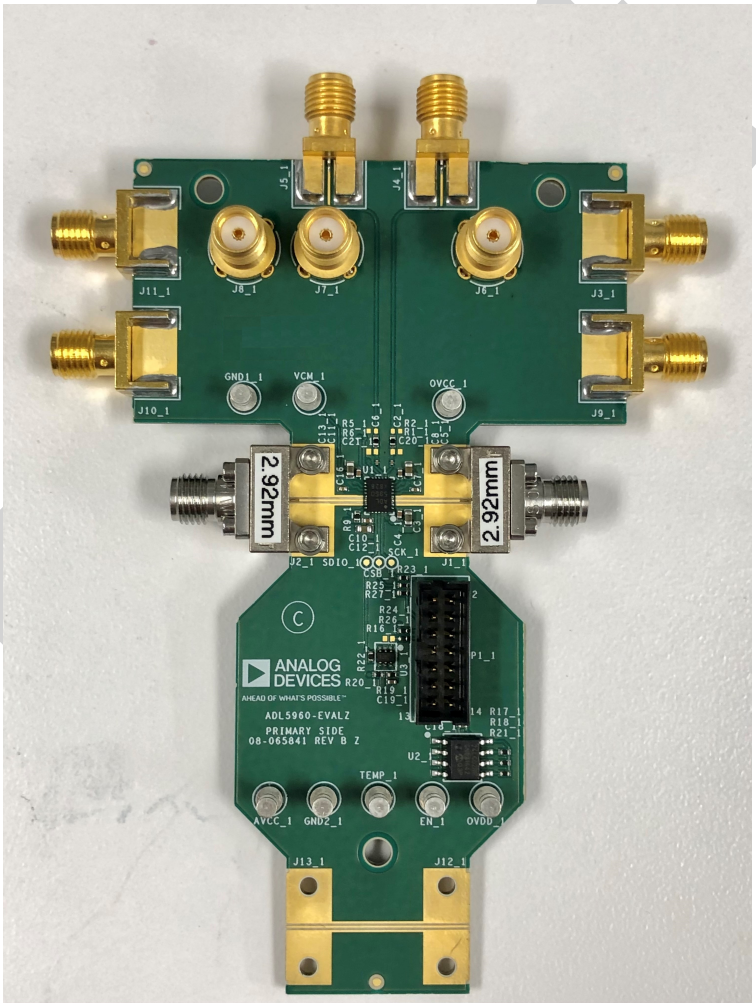

Figure 1. ADL5960-EVALZ

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EVALUATION BOARD TEST SETUP

ADL5960 evaluation board requires 5V supply with at least 500mA of current. Another 2.5V supply to set the output common mode voltage.

RF input port requires signal generator capable up to 20GHz. That is the input port to the bi-directional bridge, J1.

RF output port, J2, is the output of the bi-directional bridge. It can be connected to precision impedance standards for device calibration and for evaluating the reflection and directivity of the ADL5960 device. Then unknown impedances may be connected to this port and measured.

LO input port is differential, J4, and J5. However, it can be driven single ended with the unused port terminated with external 50 Ohm SMA termination.

IF outputs are differential, J3, J9(forward channel); J10, J11(reverse channel) for both the forward and reverse paths. The outputs can be measured single-ended using a spectrum analyzer, or differentially with an oscilloscope. Any unused IF output can be either left open or terminated with 50-Ohms.

The GUI requires a PC, with USB connection to the Linduino board, which connects to the ADL5960 EVB via the 2mm, 14-conductor ribbon cable.

50 Ohm term.LO Input Sig. Gen.

RF Output LoadRF Input Signal Generator**+2.5V+5V**To Linduino board and PC**Diff. IF outputsDiff. IF outputsGnd.+3.3V+5V**Power Supply+5V+3.3V+2.5VGnd.Spectrum Analyzer or oscilloscopeSpectrum Analyzer or oscilloscope

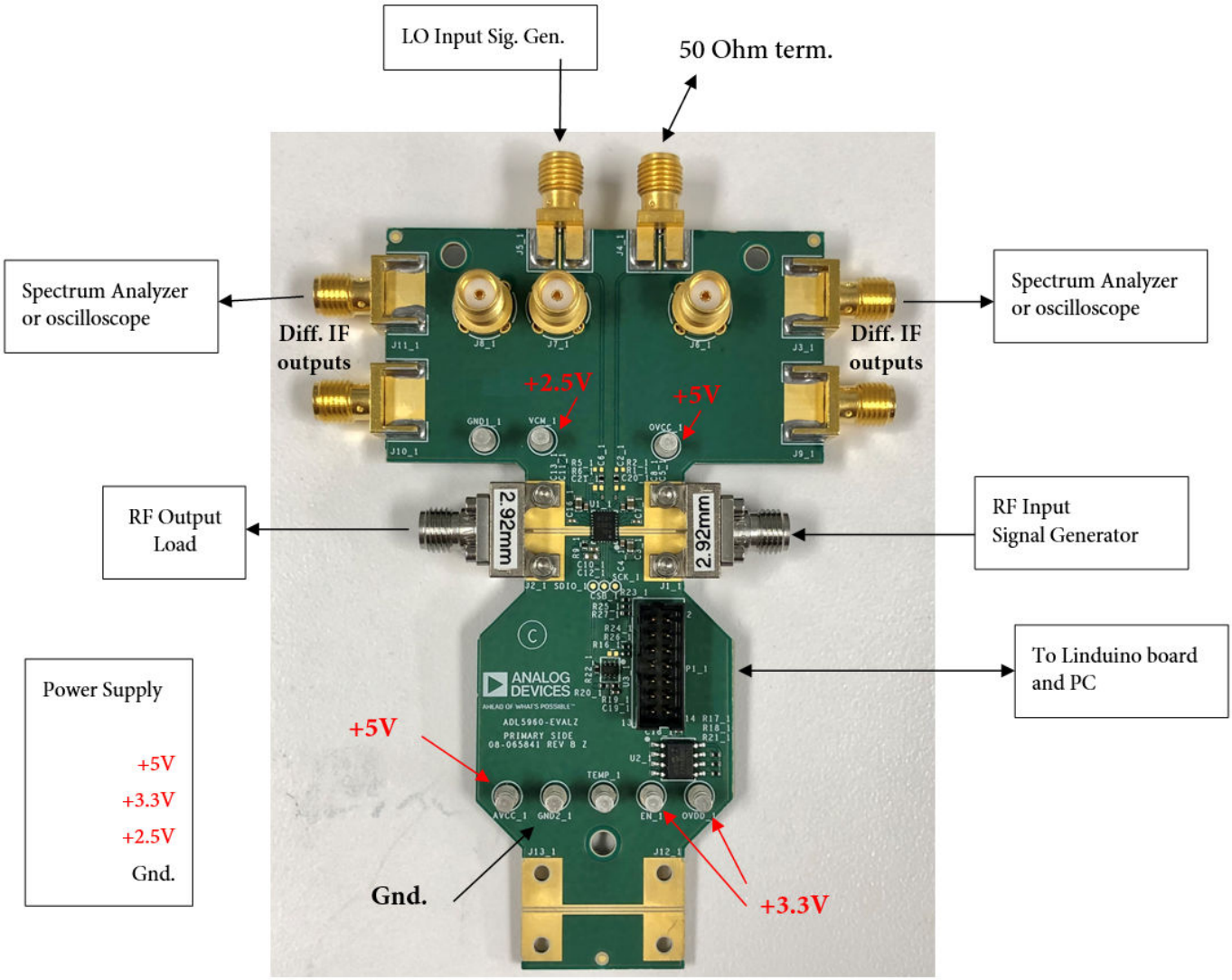


Figure 2. ADL5960-EVALZ test setup

TEST PROCEDURE

The ADL5960 EVALZ provide the hardware to fully evaluate the ADL5960.

1. Set up 5V power supply with at least 500mA of current. Connect 5V to AVCC and OVCC turret. See figure 2.
2. Connect 3.3V to EN, or use TP6 which is OVDD should be set to 3.3V, using the LInduino setting. Verify Linduino is set to 3.3V for VCCIO.
3. Connect 2.5V to the VCM turret.
4. Using the 14pin ribbon cable to connect the Linduino board to the ADL5960 EVALZ board, P1.
5. Connect signal generator to LO port. Set power level to 0dBm, frequency to 1GHz.
6. Connect the RF input to J1. Set power to 10dBm, and frequency to 1.01GHz.
7. Connect IF port to spectrum Analyzer, outputs are at 10MHz. DC blocks may be needed if the EVB does not have this feature.
8. Using PC, SPI interface can be used to program the ADL5960. IF gain, bandwidth, LO mode, IF mode are programmable. See register map for programming details.

GRAPHICAL USER INTERFACE

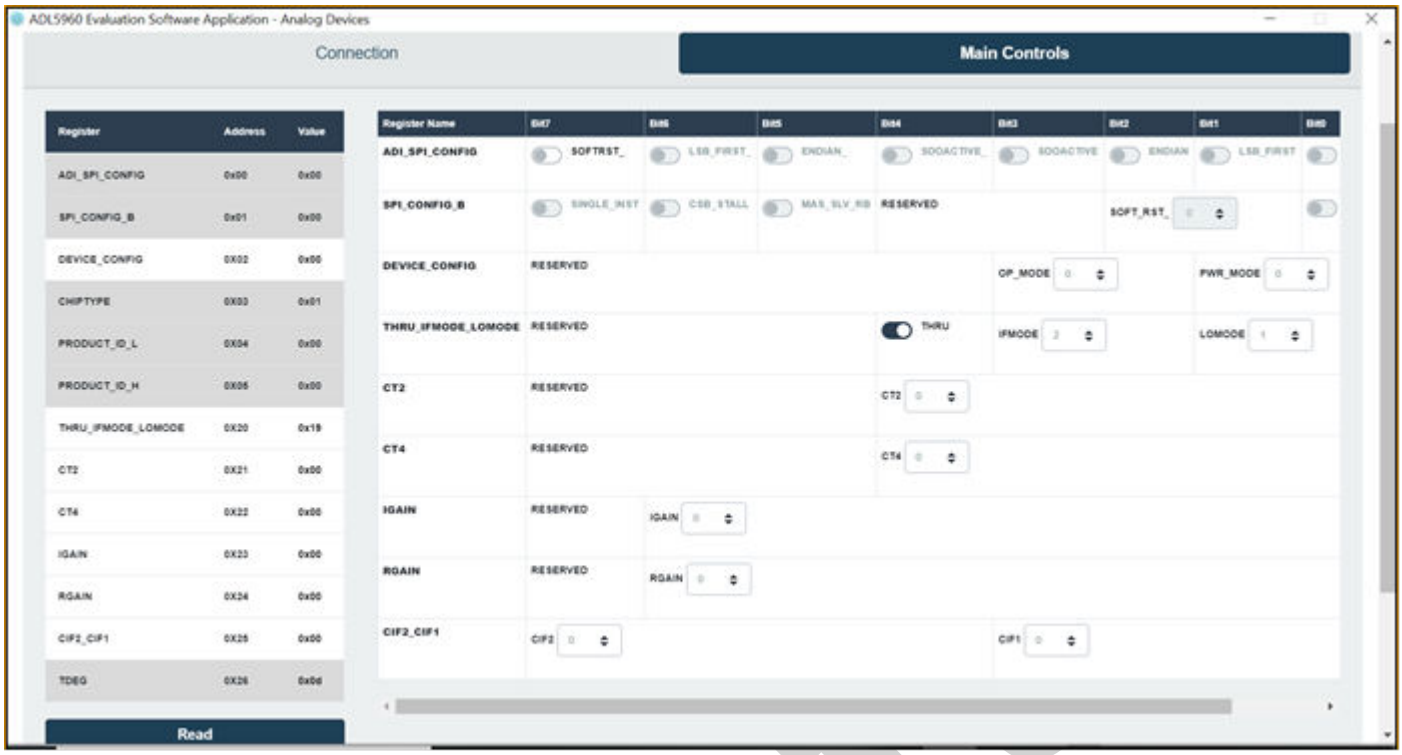


Figure 3.

THRU:

Sets the LO path to THRU mode, or the multiplier. When THRU mode is on, IFMODE and LOMODE has no effect.

IFMODE:

Configures the Offset input dividers

LOMODE:

Configures the LO path multipliers and dividers.

CT2, CT4:

Configures the LO chain x2, x4 filter settings respectively.

IGAIN, RGAIN:

Configures the forward, reverse path gain settings respectively.

CIF1, CIF2:

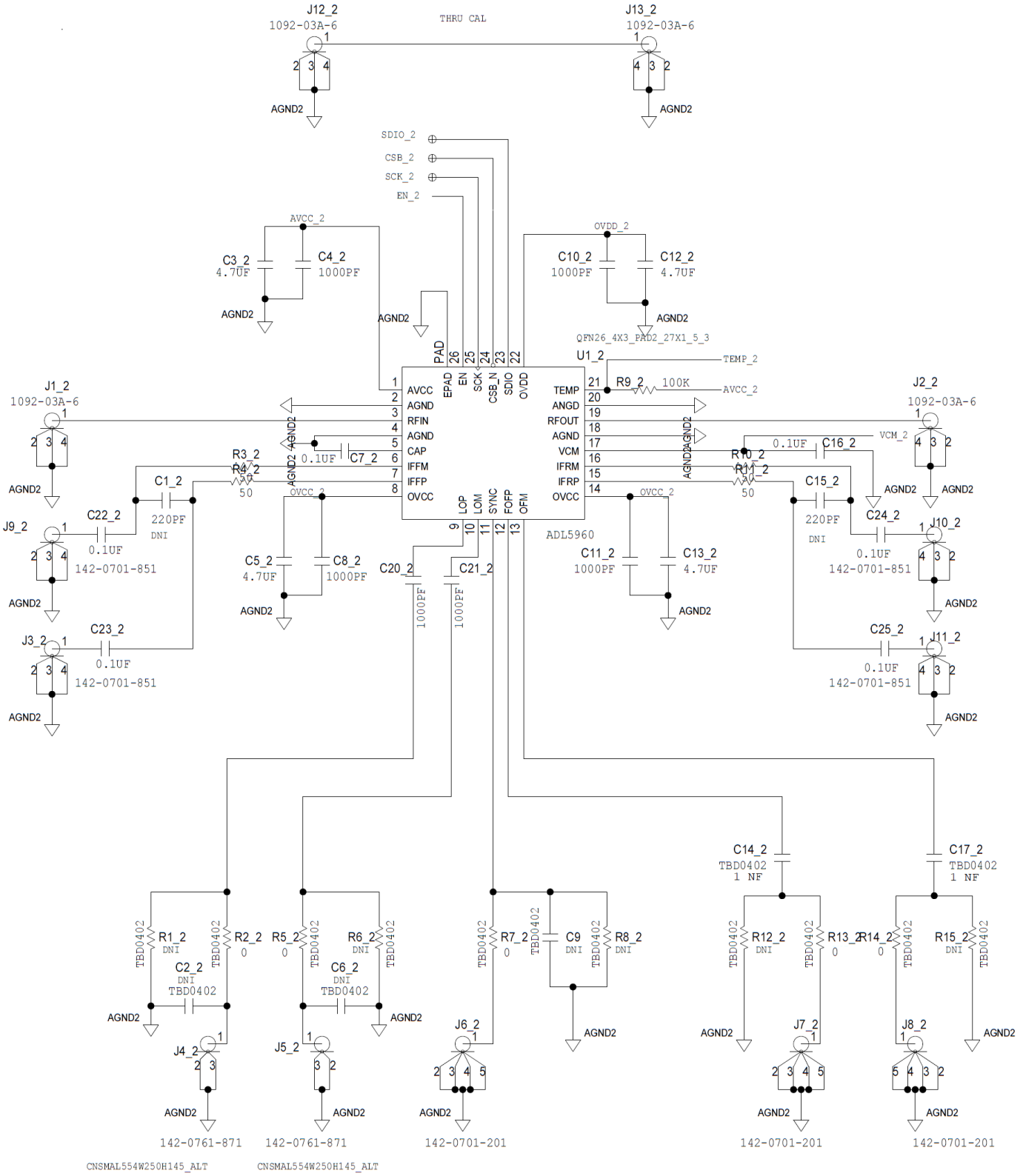
Configures the 1st and 2nd IF filter settings

PWR_MODE:

Mode 2 and 3 disable the device.

EVB SCHEMATIC

DNI denotes Do Not Install. 1nF1nF00000



EVB SCHEMATIC

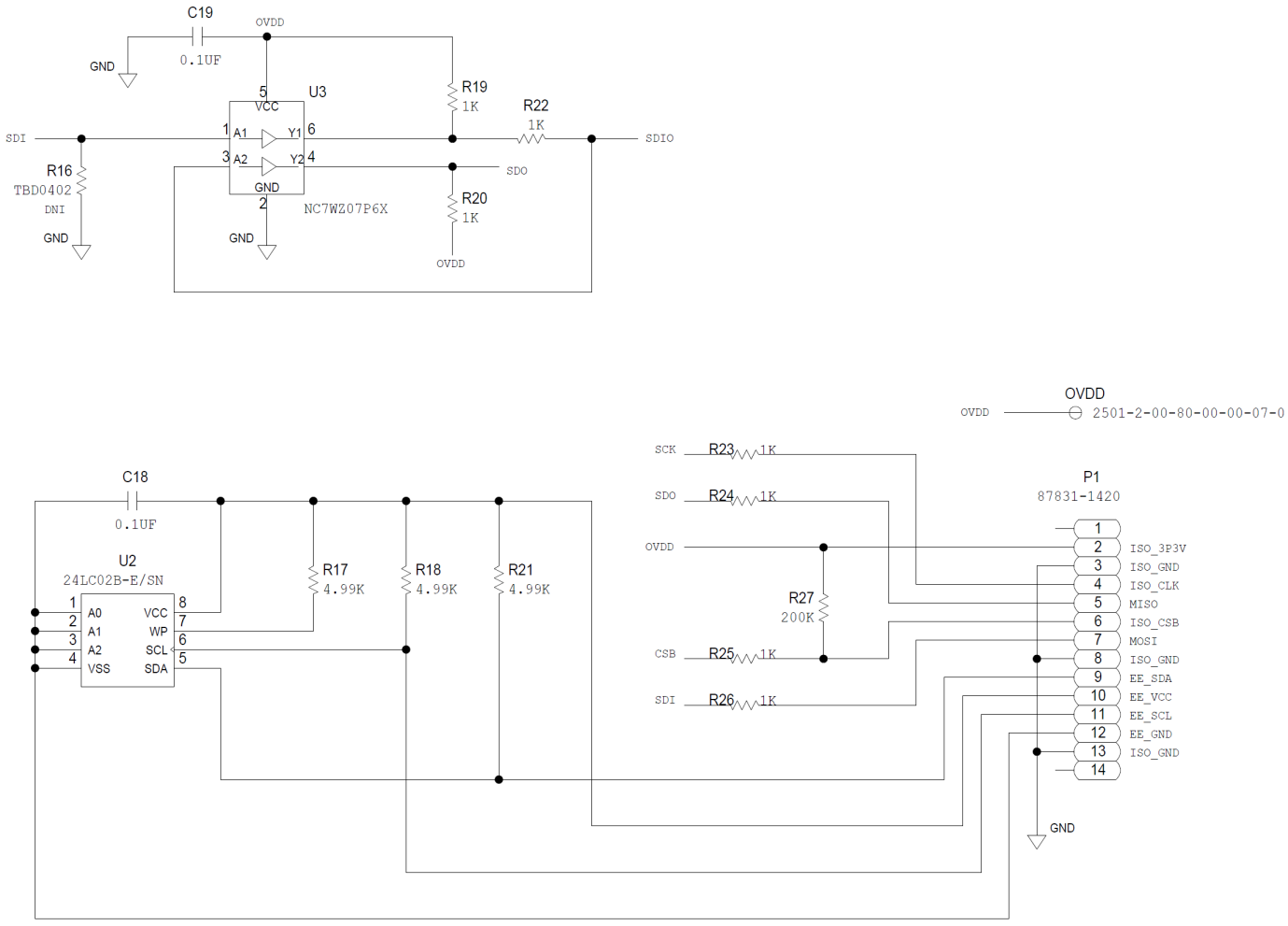


Figure 4. ADL5960 EVALZ schematic

DEMO BOARD ART WORK

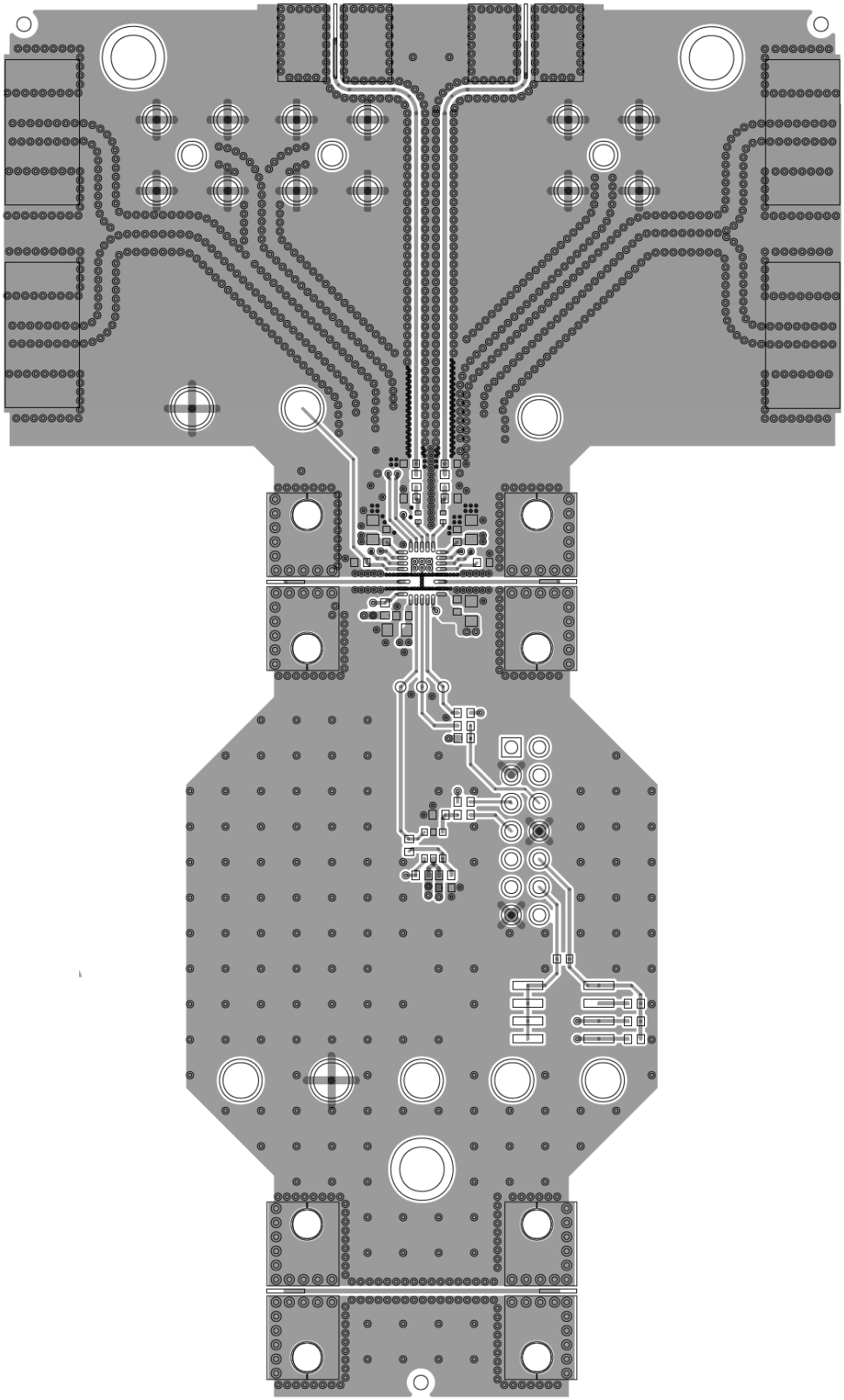


Figure 5. Layer 1

DEMO BOARD ART WORK

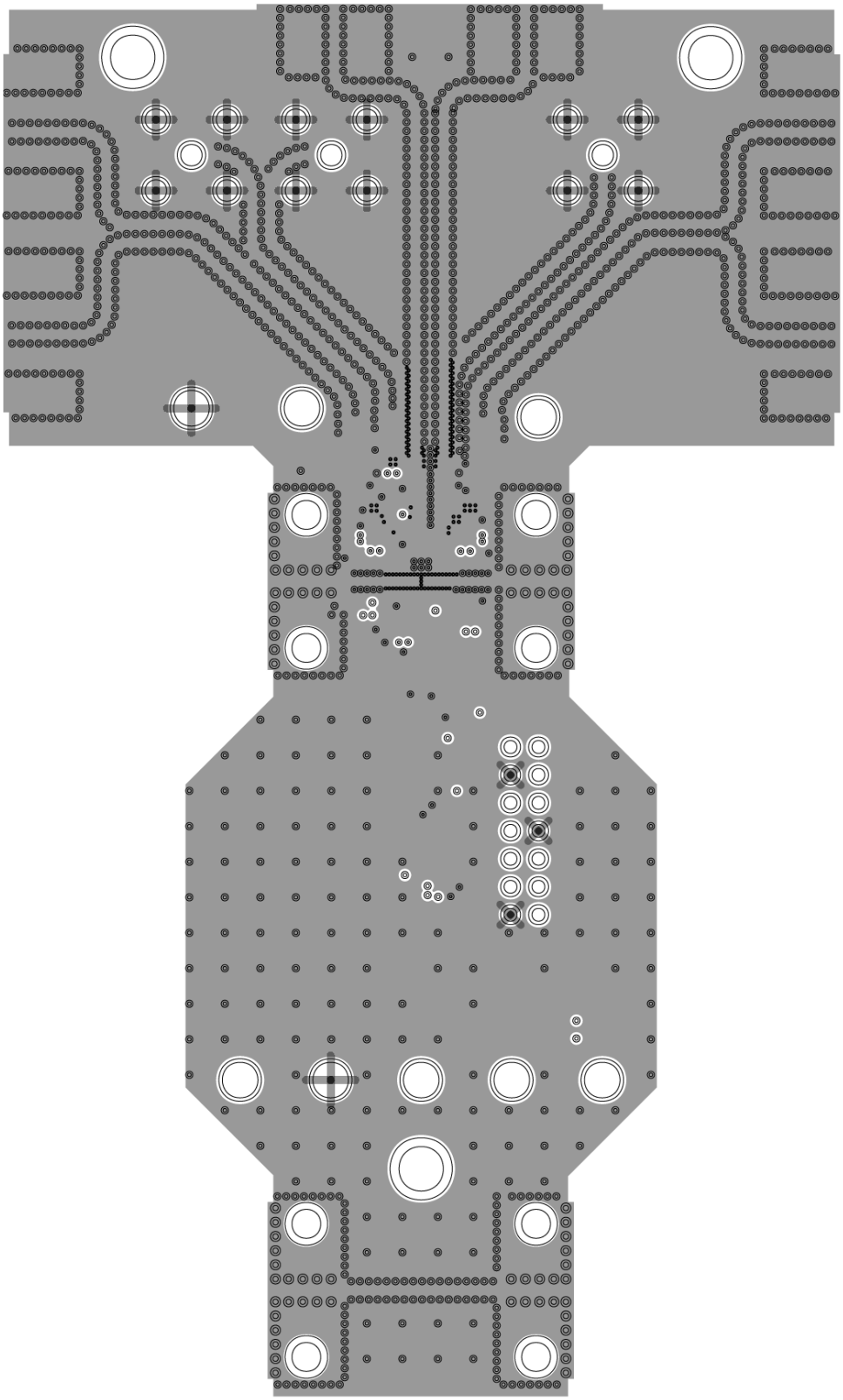


Figure 6. Layer 2

DEMO BOARD ART WORK

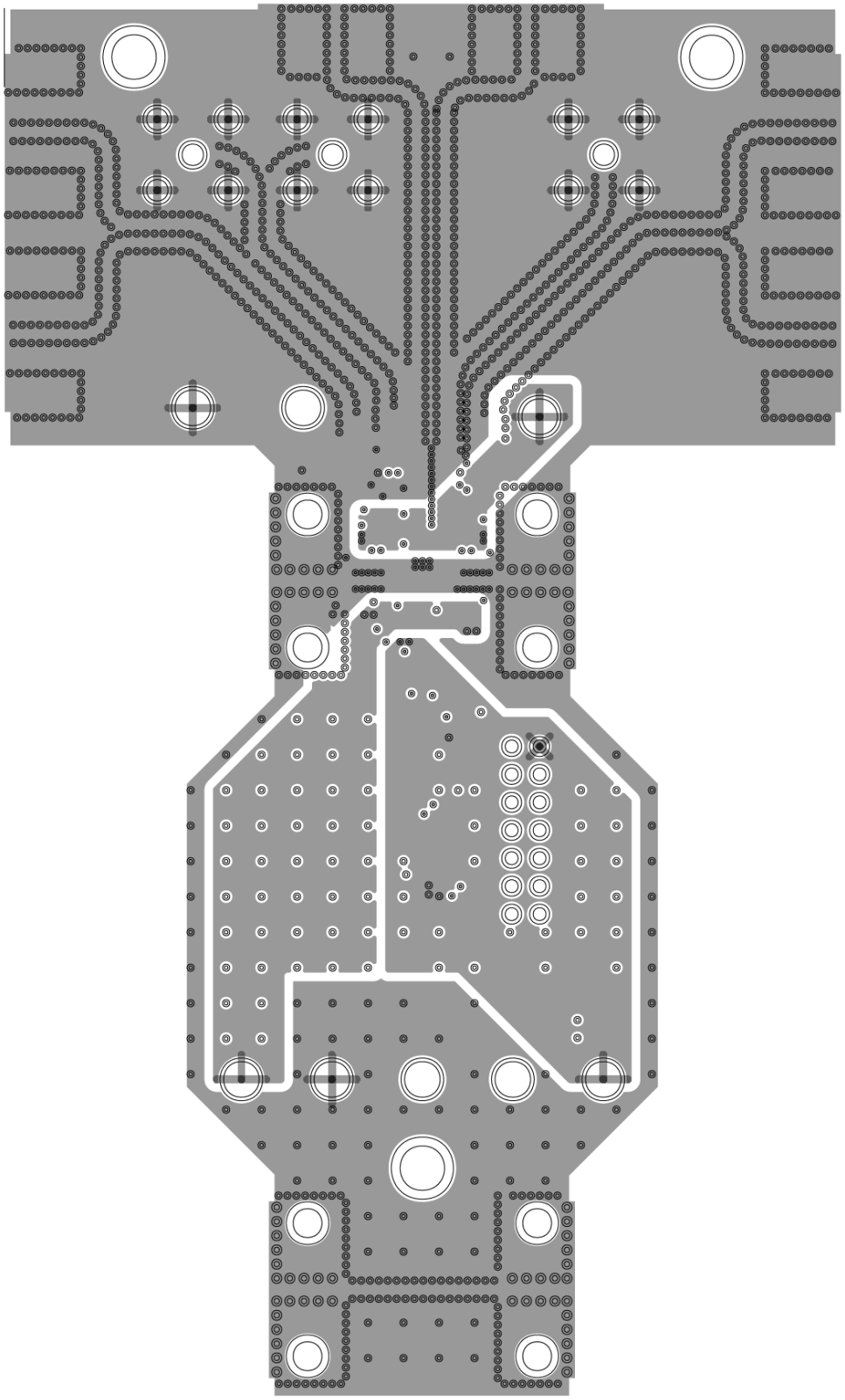


Figure 7. Layer 3

DEMO BOARD ART WORK

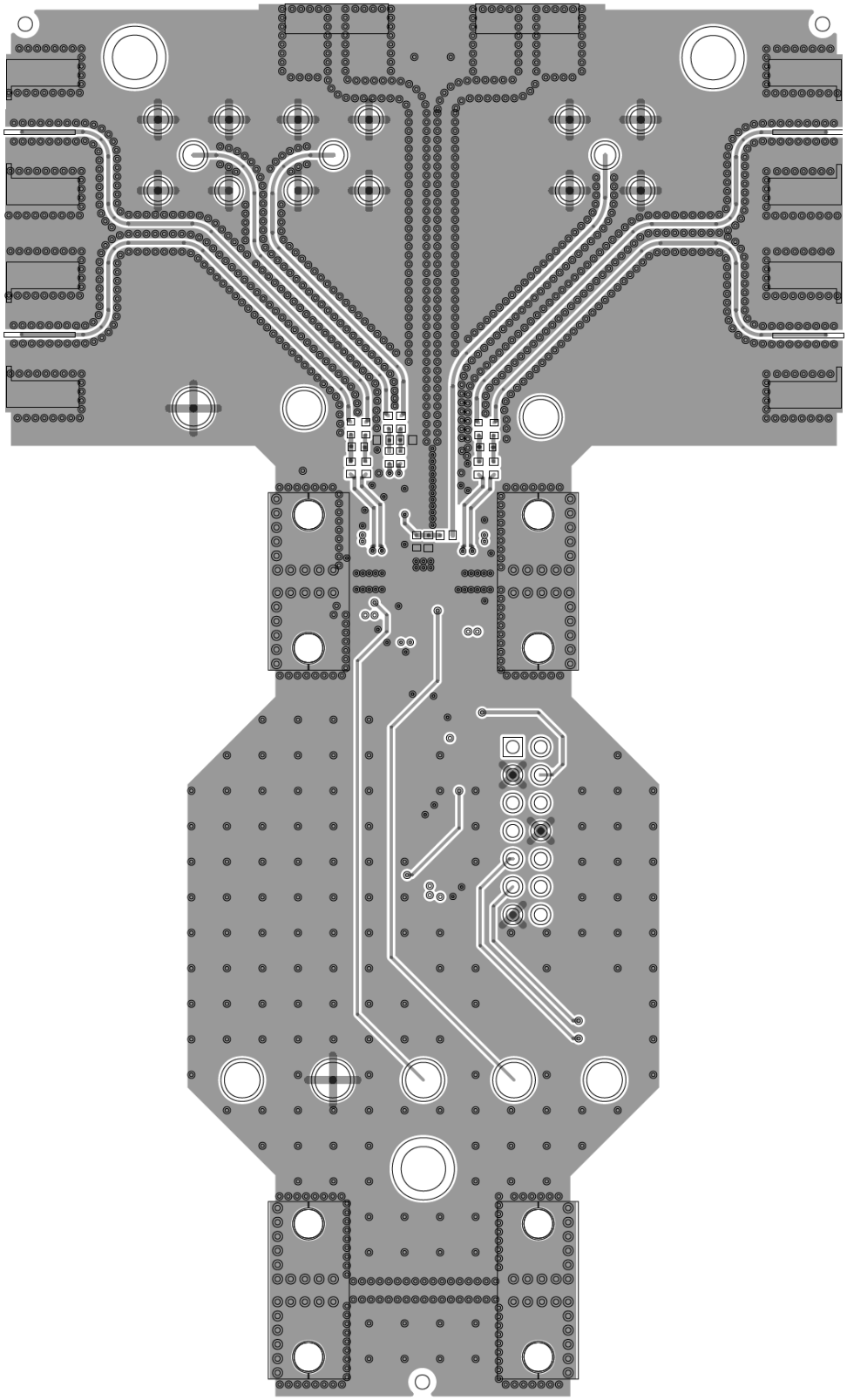


Figure 8. Layer 4

NOTES

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.