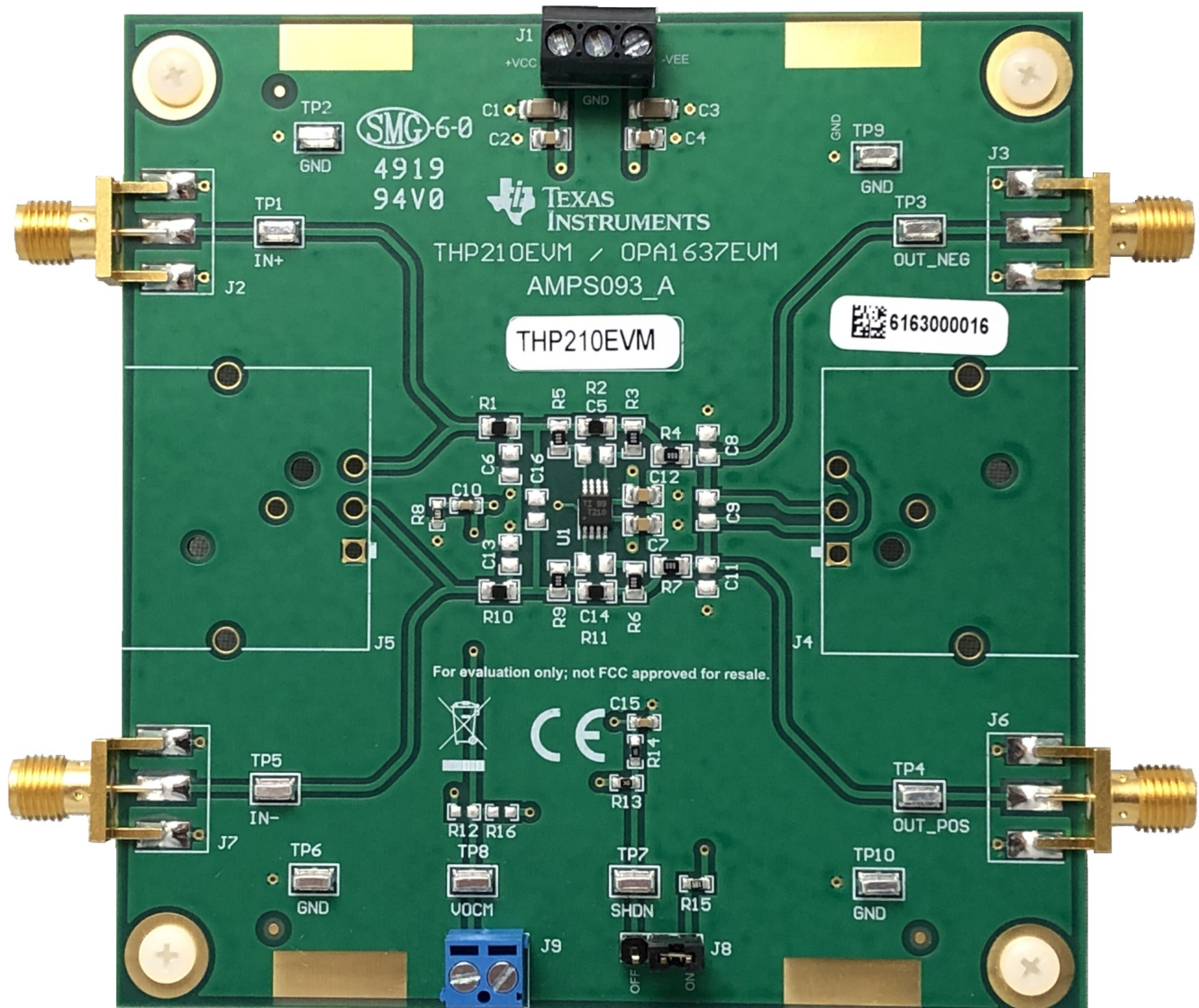


THP210 Evaluation Module



This user's guide contains information and support documentation for the THP210 evaluation module (EVM). Included are the circuit description, schematic, and bill of materials of the THP210EVM. Throughout this document, the terms evaluation board, evaluation module, and EVM are synonymous with the THP210EVM.

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1 Introduction

The THP210EVM is a high-precision, high-voltage, low-noise, fully differential amplifier that offers an easy interface to the differential output required by high-precision analog-to-digital converters (ADCs). For a full list of electrical characteristics, see the [THP210 High-Precision, High-Voltage, Low -Noise, Fully Differential Amplifier data sheet](#).

The THP210EVM fully-differential amplifier is configured by default with a gain of 1 V/V. Input and output connections are accessible using test points and SMA connectors.

1.1 Related Documentation

The following document provides information regarding Texas Instruments integrated circuits used in the assembly of the THP210EVM. This user's guide is available from the TI website under literature number SBOU234. Any letter appended to the literature number corresponds to the document revision that is current at the time of the writing of this document. Newer revisions may be available from the TI website at <http://www.ti.com/>, or call the Texas Instruments Literature Response Center at (800) 477-8924 or the Product Information Center at (972) 644-5580. When ordering, identify the document by both title and literature number.

Table 1. Related Documentation

Device	Literature Number
THP210	SBOS932

1.2 Electrostatic Discharge Caution

Many of the components on the THP210EVM are susceptible to damage by electrostatic discharge (ESD). Customers are advised to observe proper ESD handling precautions when unpacking and handling the EVM, including the use of a grounded wrist strap at an approved ESD workstation.

2 Schematic, PCB Layout, and Bill of Materials

This section contains the schematic, bill of materials, and PCB layout for the THP210EVM.

2.1 Schematic

Figure 1 illustrates the EVM schematic.

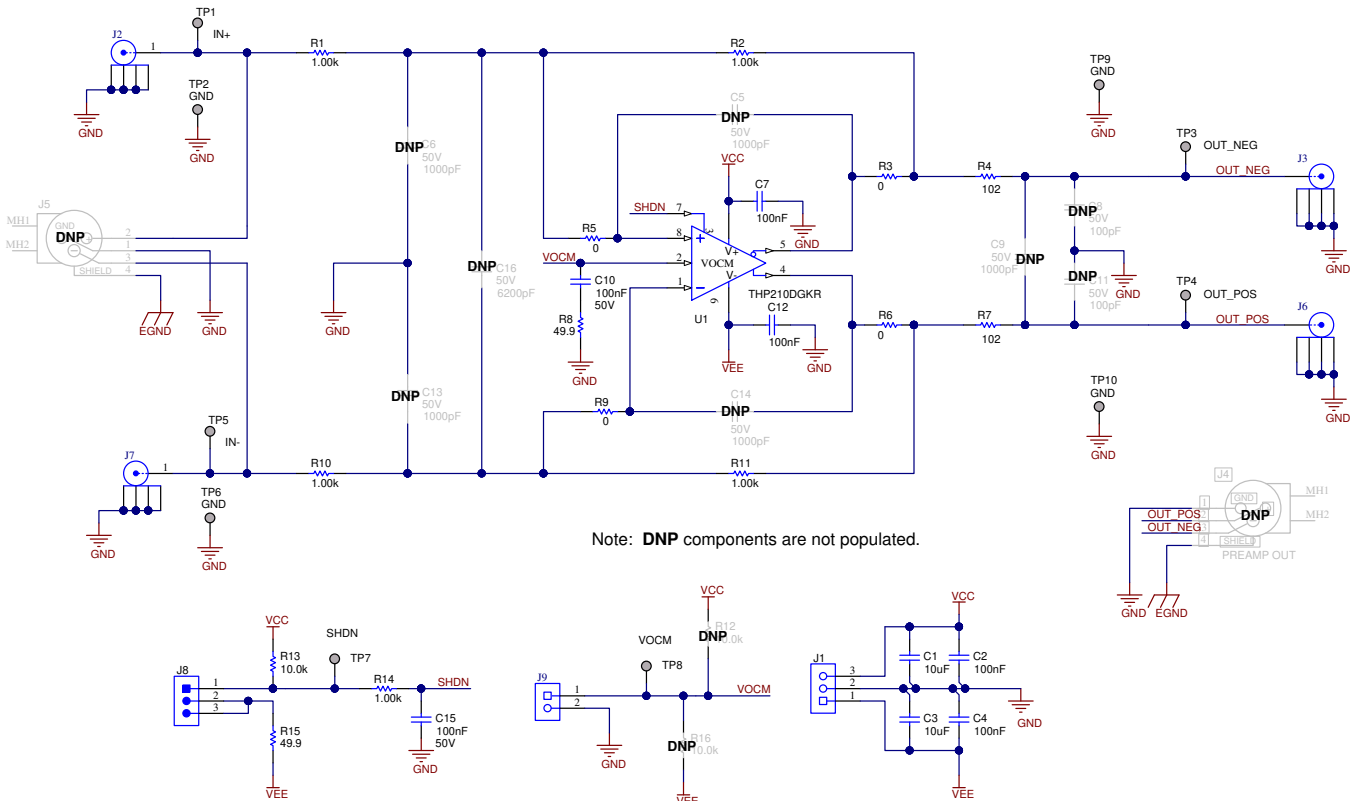


Figure 1. THP210EVM Schematic

2.2 PCB Layout

The THP210EVM is a four-layer PCB design. Figure 2 to Figure 6 show the PCB layer illustrations.

The top layer consists of all analog signal path traces, and is poured with a solid ground plane. To minimize second and other even-harmonic content, route traces as symmetrically as possible for both positive and negative feedback pathways. Place feedback components in close proximity to the output and input pins of the device. Position decoupling capacitors C7 and C12 on the top layer as close as possible to the power-supply pins.

The second internal layer is a dedicated solid GND plane. Place independent vias at the ground connection of every component to provide a low-impedance path to ground.

The third internal layer routes the power-supply connections.

The fourth layer routes the shutdown pin and VOCM pin connections.

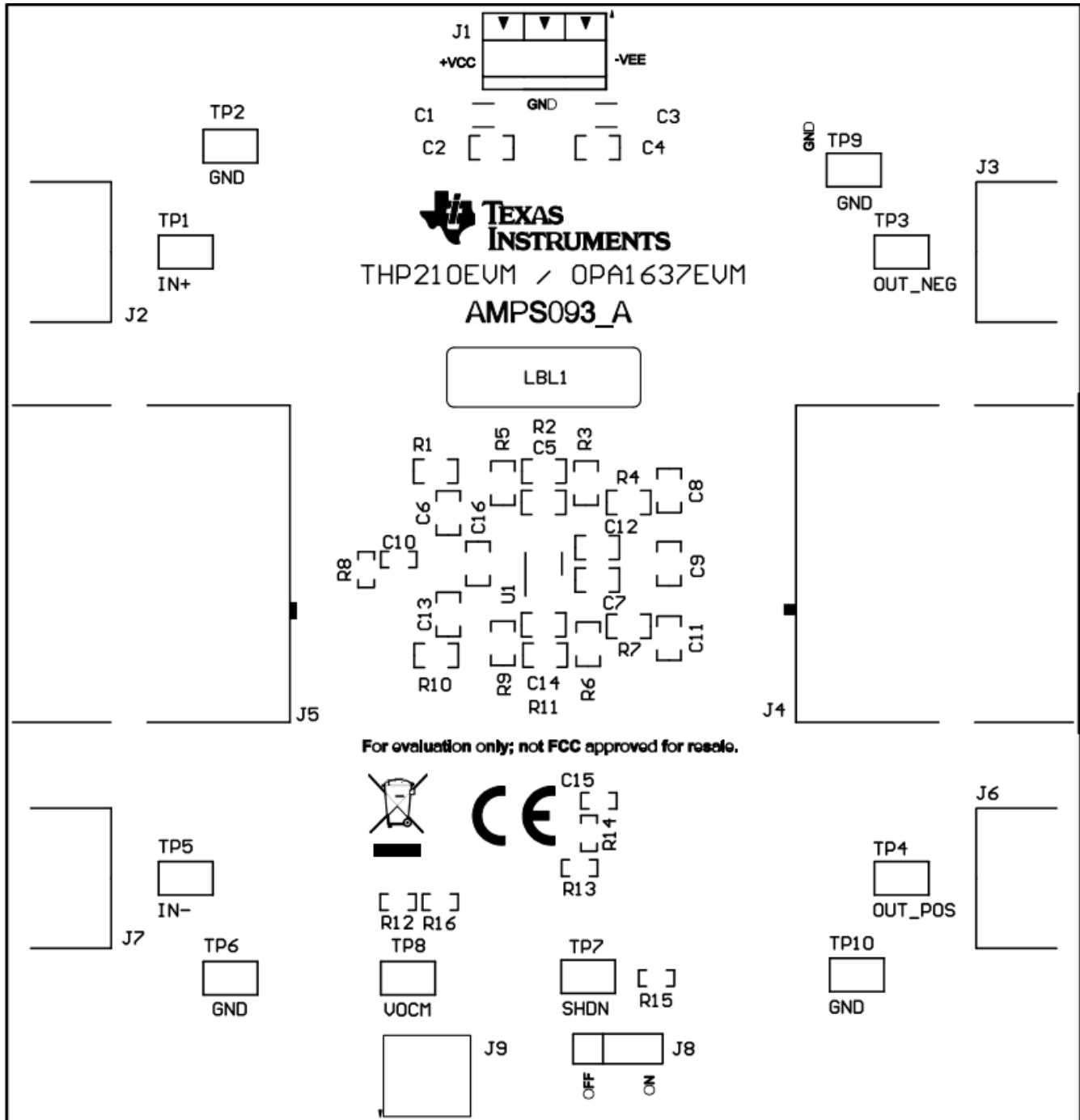


Figure 2. Top Overlay PCB Layout

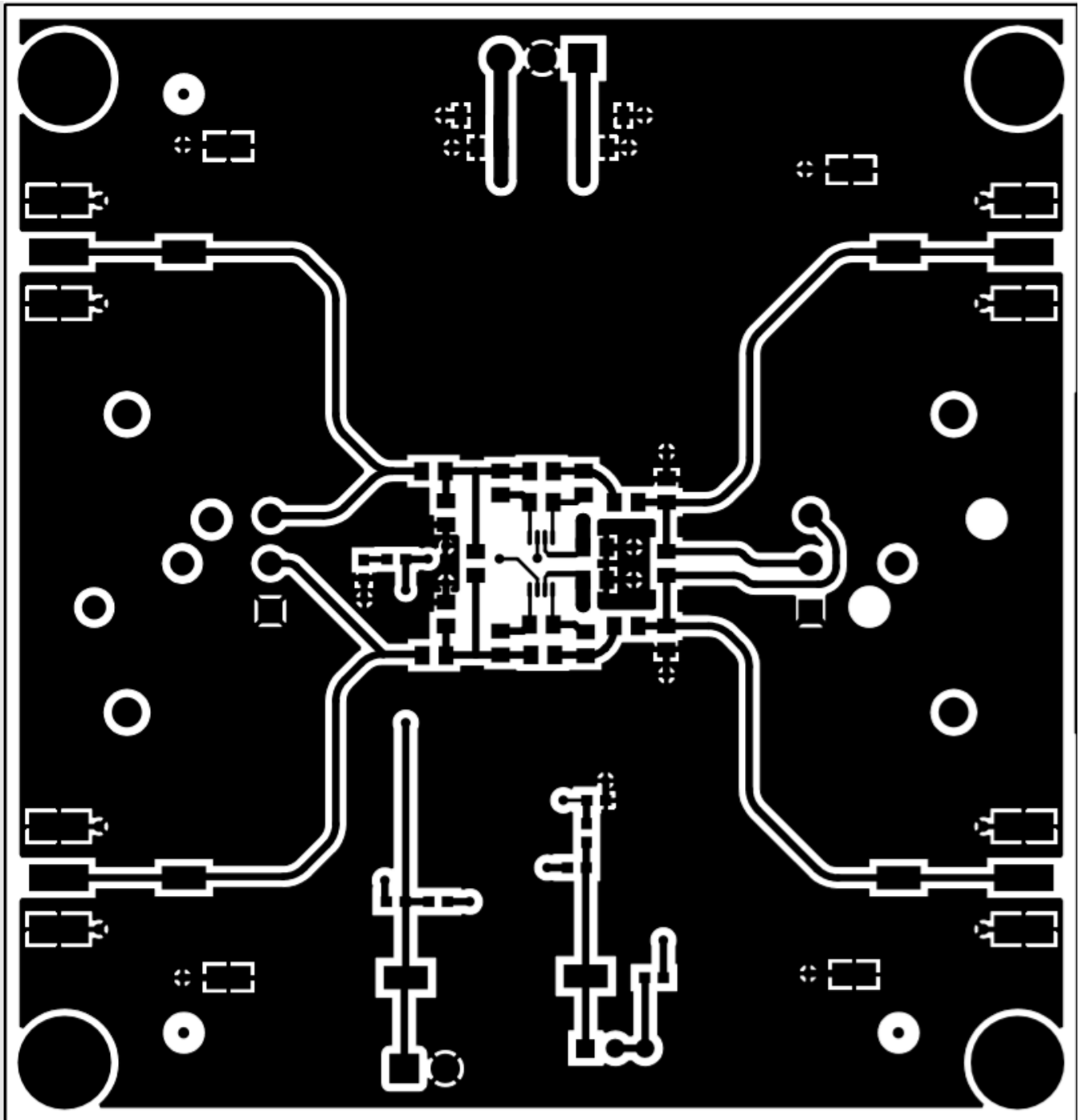


Figure 3. Top Layer PCB Layout

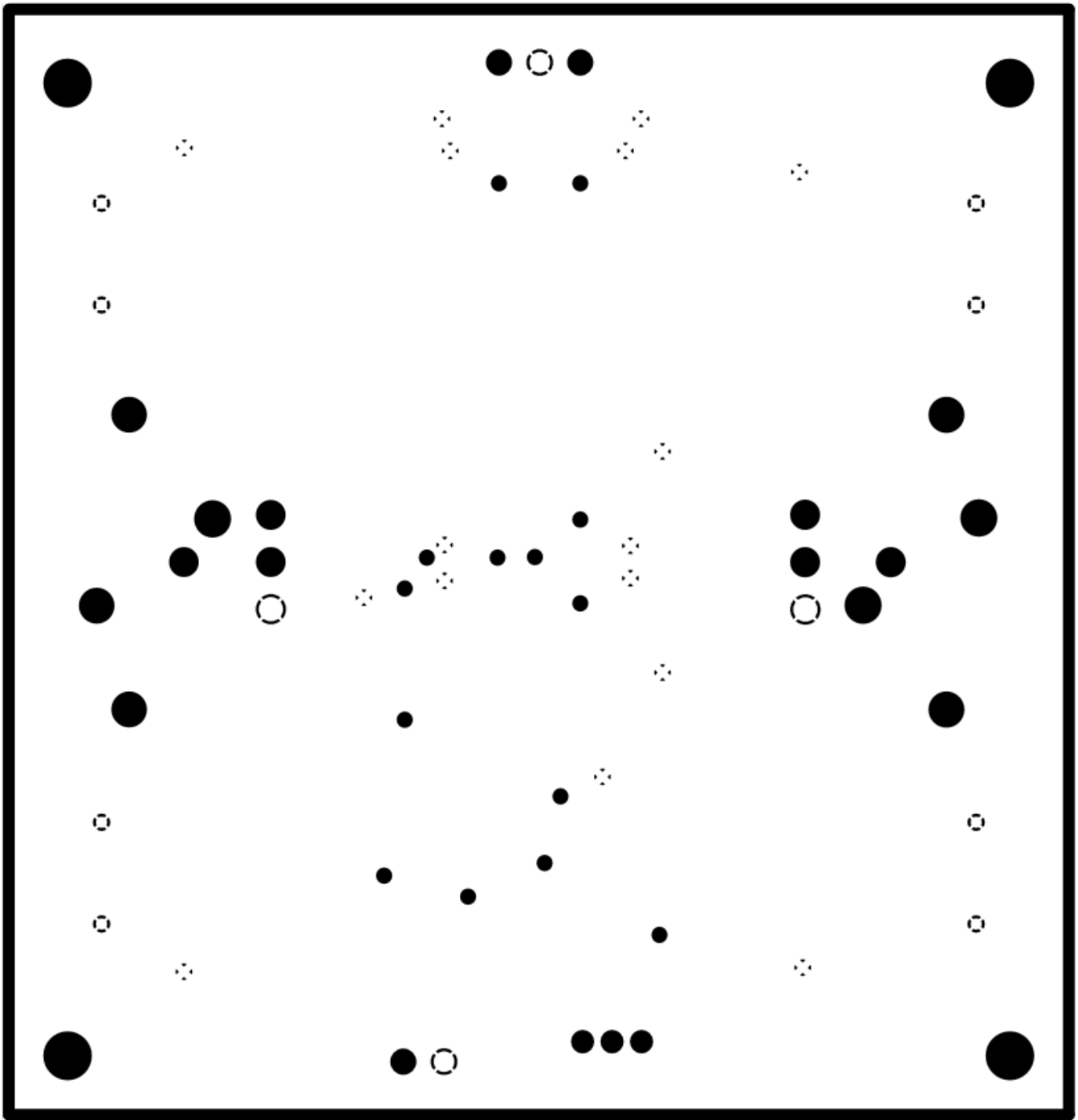


Figure 4. Ground Layer PCB Layout

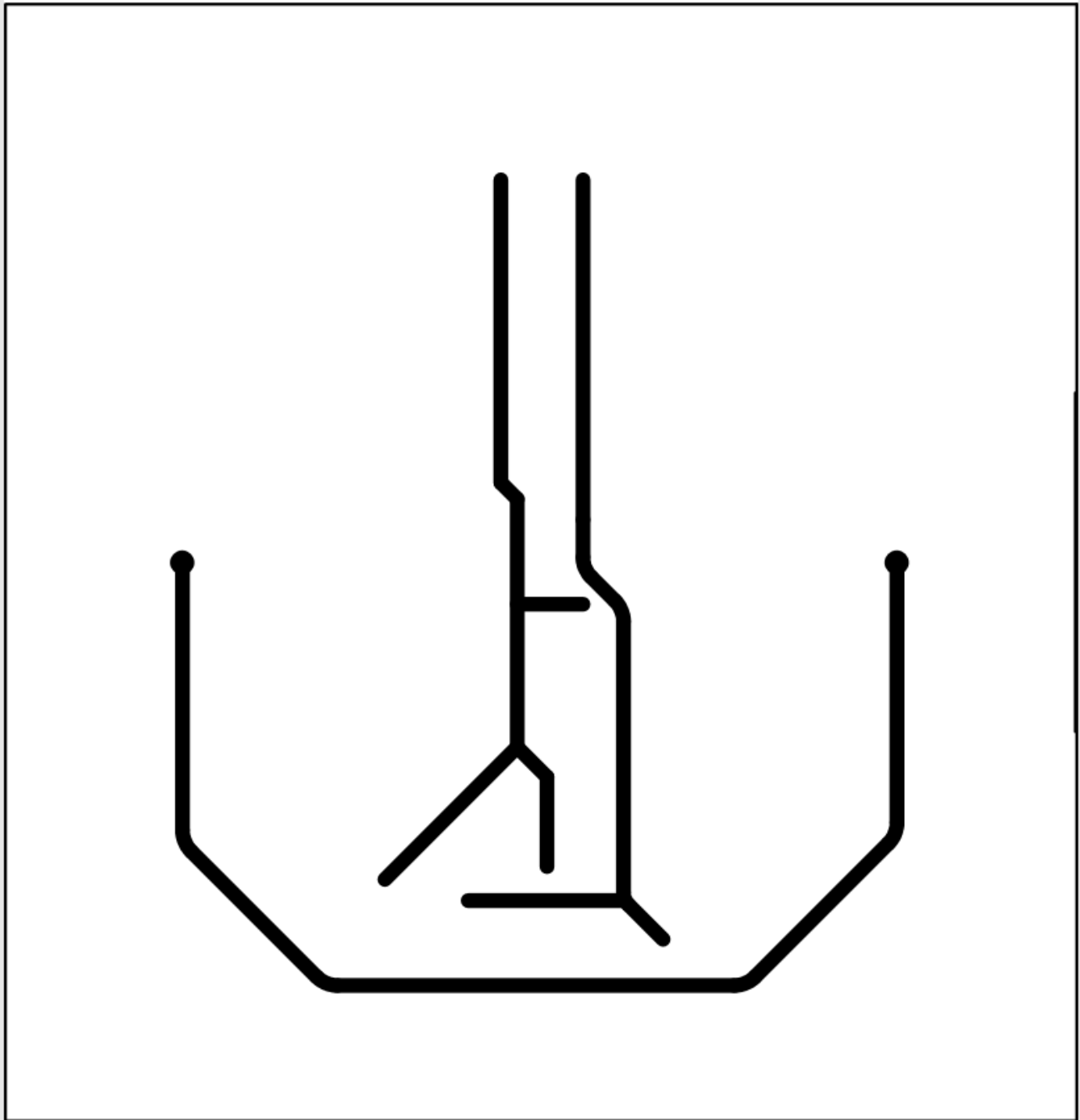


Figure 5. Power Layer PCB Layout

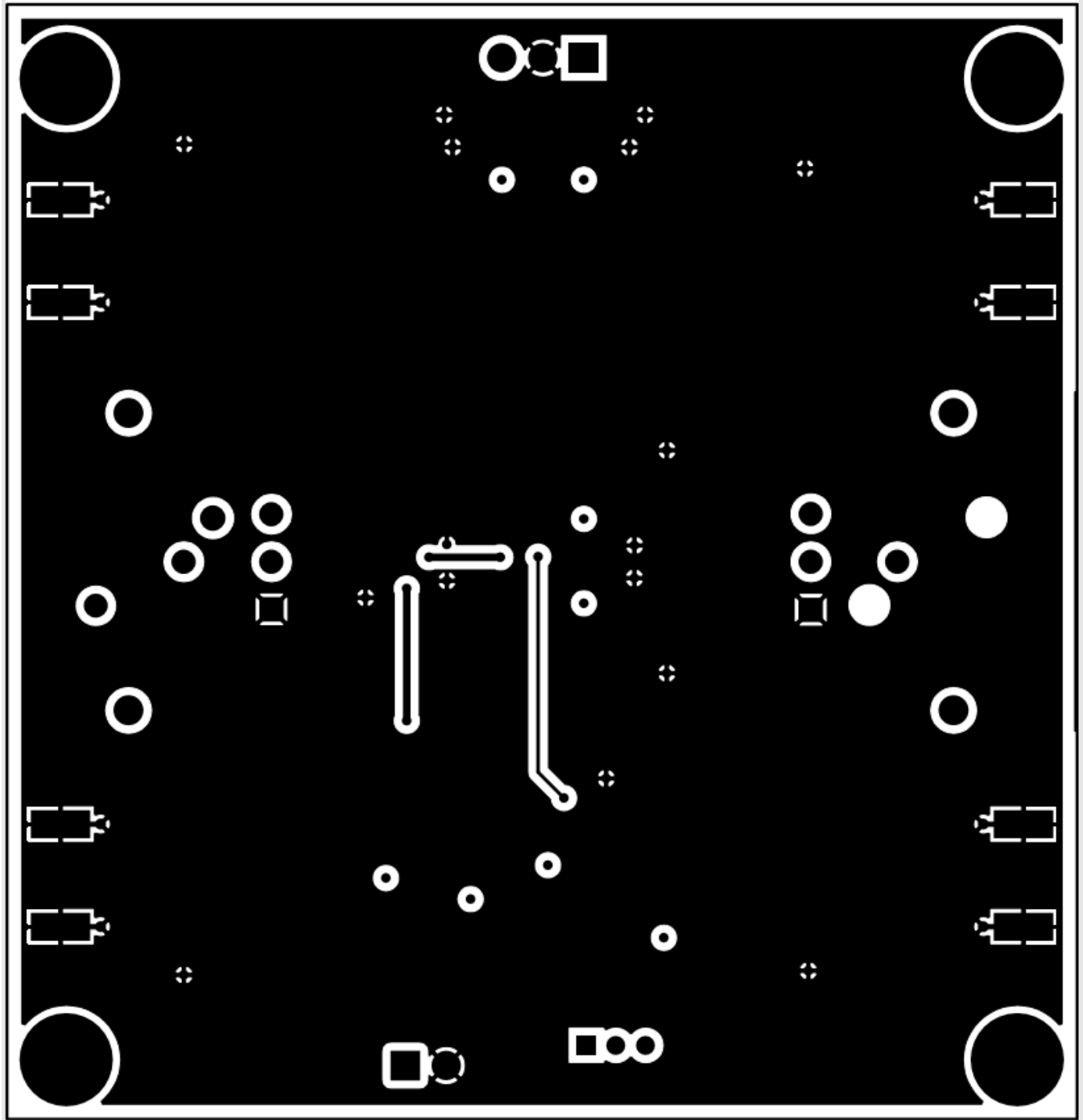


Figure 6. Bottom Layer PCB Layout

2.3 Bill of Materials

Table 2 lists the THP210EVM bill of materials (BOM).

Table 2. THP210EVM Bill of Materials

Designator	Qty	Value	Description	Package Reference	Part Number	Manufacturer
!PCB1	1		Printed Circuit Board		AMPS093	Any
C1, C3	2	10uF	CAP, CERM, 10 uF, 35 V, +/- 10%, X7R, 1206	1206	C3216X7R1V106K160AC	TDK
C2, C4, C7, C12	4	0.1uF	CAP, CERM, 0.1 uF, 50 V, +/- 10%, X7R, 0805	0805	08055C104KAT2A	AVX
C10, C15	2	0.1uF	CAP, CERM, 0.1 uF, 50 V, +/- 5%, X7R, 0603	0603	C0603C104J5RACTU	Kemet
H1, H2, H3, H4	4		Machine Screw, Round, #4-40 x 1/4, Nylon, Philips panhead	Screw	NY PMS 440 0025 PH	B&F Fastener Supply
H5, H6, H7, H8	4		Standoff, Hex, 0.5"L #4-40 Nylon	Standoff	1902C	Keystone
J1	1		Terminal Block, 3.5mm Pitch, 3x1, TH	10.5x8.2x6.5mm	ED555/3DS	On-Shore Technology
J2, J3, J6, J7	4		Connector, End launch SMA, 50 ohm, SMT	End Launch SMA	142-0701-801	Cinch Connectivity
J4	Do not Install		Receptacle, Male, 3 Position, R/A, TH	Receptacle, Male, 3 Position, R/A, TH	PQG3MRA112	Switchcraft
J5	Do Not Install		Receptacle, 160mil, 3 Position, R/A, TH	Receptacle, 160mil, 3 Position, R/A, TH	PQG3FRA112	Switchcraft
J8	1		Header, 100mil, 3x1, Gold, TH	PBC03SAAN	PBC03SAAN	Sullins Connector Solutions
J9	1		Terminal Block, 3.5mm Pitch, 2x1, TH	7.0x8.2x6.5mm	ED555/2DS	On-Shore Technology
R1, R2, R10, R11	4	1.00k	RES, 1.00 k, 1%, 0.25 W, 0805	0805	ERJ-P06F1001V	Panasonic
R3 R5, R6, R9	4	0	RES, 0, 0%, W, AEC-Q200 Grade 0, 0805	0805	PMR10EZPJ000	Rohm
R4, R7	2	102	RES, 102, 1%, 0.125 W, AEC-Q200 Grade 0, 0805	0805	CRCW0805102RFKEA	Vishay-Dale
R8, R15	2	49.9	RES, 49.9, 1%, 0.1 W, AEC-Q200 Grade 0, 0603	0603	CRCW060349R9FKEA	Vishay-Dale
R13	1	10.0k	RES, 10.0 k, 1%, 0.1 W, 0603	0603	ERJ-3EKF1002V	Panasonic
R14	1	1.00k	RES, 1.00 k, 1%, 0.1 W, AEC-Q200 Grade 0, 0603	0603	CRCW06031K00FKEA	Vishay-Dale
SH-J1	1	1x2	Shunt, 100mil, Flash Gold, Black	Closed Top 100mil Shunt	SPC02SYAN	Sullins Connector Solutions
TP1, TP2, TP3, TP4, TP5, TP6, TP7, TP8, TP9, TP10	10		Test Point, Miniature, SMT	Test Point, Miniature, SMT	5019	Keystone
U1	1		THP210, high, precision, high voltage, low noise, fully differential amplifier	DGK0008A	THP210DGKR	Texas Instruments

Revision History

NOTE: Page numbers for previous revisions may differ from page numbers in the current version.

Changes from Original (December 2019) to A Revision	Page
• Changed THP210EVM Schematic R4, R7 102-Ohms	4
• Changed BOM: R4, R7 102-Ohms	10

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