



ABSTRACT

The OPA2863DGKEVM is an evaluation module for the dual-channel OPA2863 amplifier in the DGK (VSSOP-8) package. The OPA2863 is a low-power, unity-gain stable, rail-to-rail input/output, voltage-feedback operational amplifier designed to operate over a power-supply range of 2.7 V to 12.6 V. The OPA2863DGKEVM is designed to quickly and easily demonstrate the functionality and versatility of the amplifier. The EVM is ready to connect to power, signal source, and test instruments through the use of onboard connectors. The EVM is configured for easy connection with common 50-Ω laboratory equipment at its inputs and outputs. Each amplifier is configured for single-ended inputs with a non-inverting signal gain of 1 V/V at the device output. The OPA2863DGKEVM has a total onboard load of 2 kΩ to each amplifier. The output resistor network converts the output to a 50-Ω impedance source. The evaluation module can be easily configured for other functions, gains, and single- or split-supply operation.

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Trademarks

All other trademarks are the property of their respective owners.

1 Features

This EVM supports the following features:

- Configured for split-supply operation and easily modified for single supply
- Default gain of 1 V/V configuration can be easily reconfigured for other gains
- Designed for easy connection to standard 50-Ω input and output impedance test equipment
- Simple interface to the inputs and outputs through the SMA connectors

2 EVM Specifications

Table 2-1 lists the EVM specifications.

Table 2-1. EVM Specifications

Parameter	Value
Single-supply voltage range ($V_- = \text{ground}$)	2.7 V to 12.6 V
$V_{S\pm}$ Split-supply voltage range	± 1.35 V to ± 6.3 V
$I_{Q\pm}$ Supply current (no load)	720 μ A per amplifier
Input voltage	$V_{S\pm, \text{Max}}$
I_{OUT} Linear output drive	± 30 mA

3 Power Connections

The OPA2863DGKEVM is equipped with test point connectors for easy connection of power. The positive supply input is red and is labeled V_+ . The negative supply input is yellow and is labeled V_- . The ground is black and is labeled GND.

3.1 Split-Supply Operation

To operate as split supply, apply the positive-supply voltage to V_+ , negative-supply voltage to V_- , and the ground reference from supply to GND.

3.2 Single-Supply Operation

To operate as single supply, connect both the V_- connector and the GND connector to ground and apply the positive-supply voltage to V_+ . Inputs and outputs must be biased per the specifications listed in the data sheet for proper operation.

4 Input and Output Connections

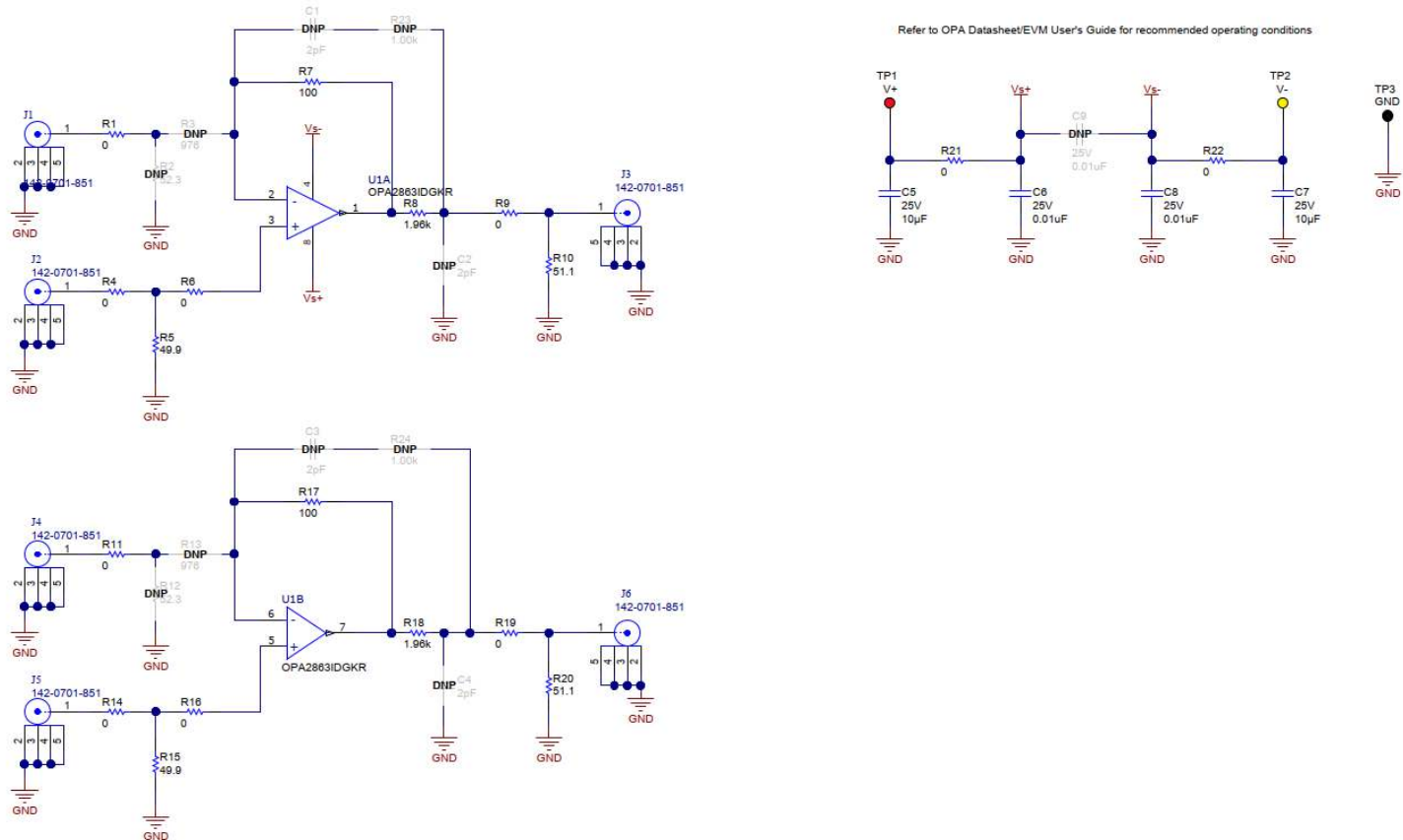
The OPA2863DGKEVM is equipped with SMA connectors for connection of signal generators and analysis equipment. As shipped, the EVM is configured for a non-inverting gain of 1 V/V, split-supply operation, single-ended input and output with 50-Ω termination. For best results, signals must be routed to and from the EVM with cables having 50-Ω characteristic impedance. INA_+ (J2) and INB_+ (J5) must be used for single-ended input with 50-Ω source. $OUTA$ (J3) and $OUTB$ (J6) are the output connectors for amplifiers A and B respectively. A resistor network (R8, R9, and R10 for amplifier A; R18, R19, and R20 for amplifier B) at the output of the amplifiers convert the output signal to 50-Ω single-ended source, and provides a 2-kΩ load to the amplifier when terminated with 50-Ω load at J3 and J6. A 50-Ω line-impedance match at $OUTA$ (J3) and $OUTB$ (J6) must be preserved. This results in an output measurement loss, and the overall attenuation is approximately 38 dB. See the applications section, schematics, and layouts in the [OPAx863 Low-Power, 100-MHz, Rail-to-Rail Input and Output, Voltage-Feedback Amplifier Data Sheet](#), for more details on how to reconfigure the EVM.

5 OPA2863DGKEVM Schematic, Layout, PCB 3D Render, and Bill of Materials

This section contains the EVM schematic, layout images, PCB 3D render images, and the bill of materials.

5.1 Schematic

Figure 5-1 illustrates the EVM schematic.



See the OPA2863 data sheet for recommended operating conditions.

Figure 5-1. OPA2863DGKEVM Schematic

5.2 OPA2863DGKEVM Layers

Figure 5-2 to Figure 5-5 show the OPA2863DGKEVM layers.

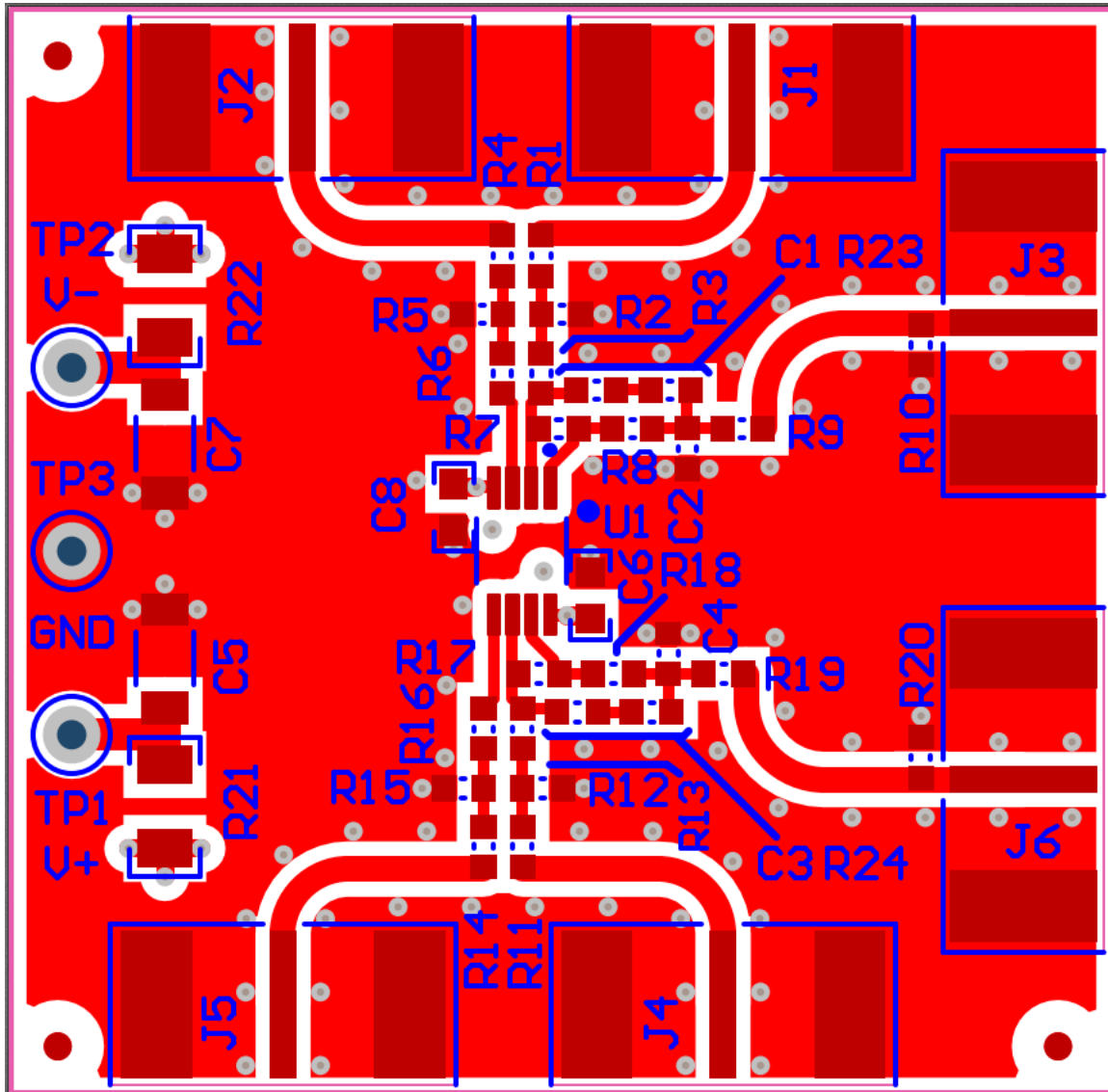


Figure 5-2. OPA2863DGKEVM Top Layer, Signal

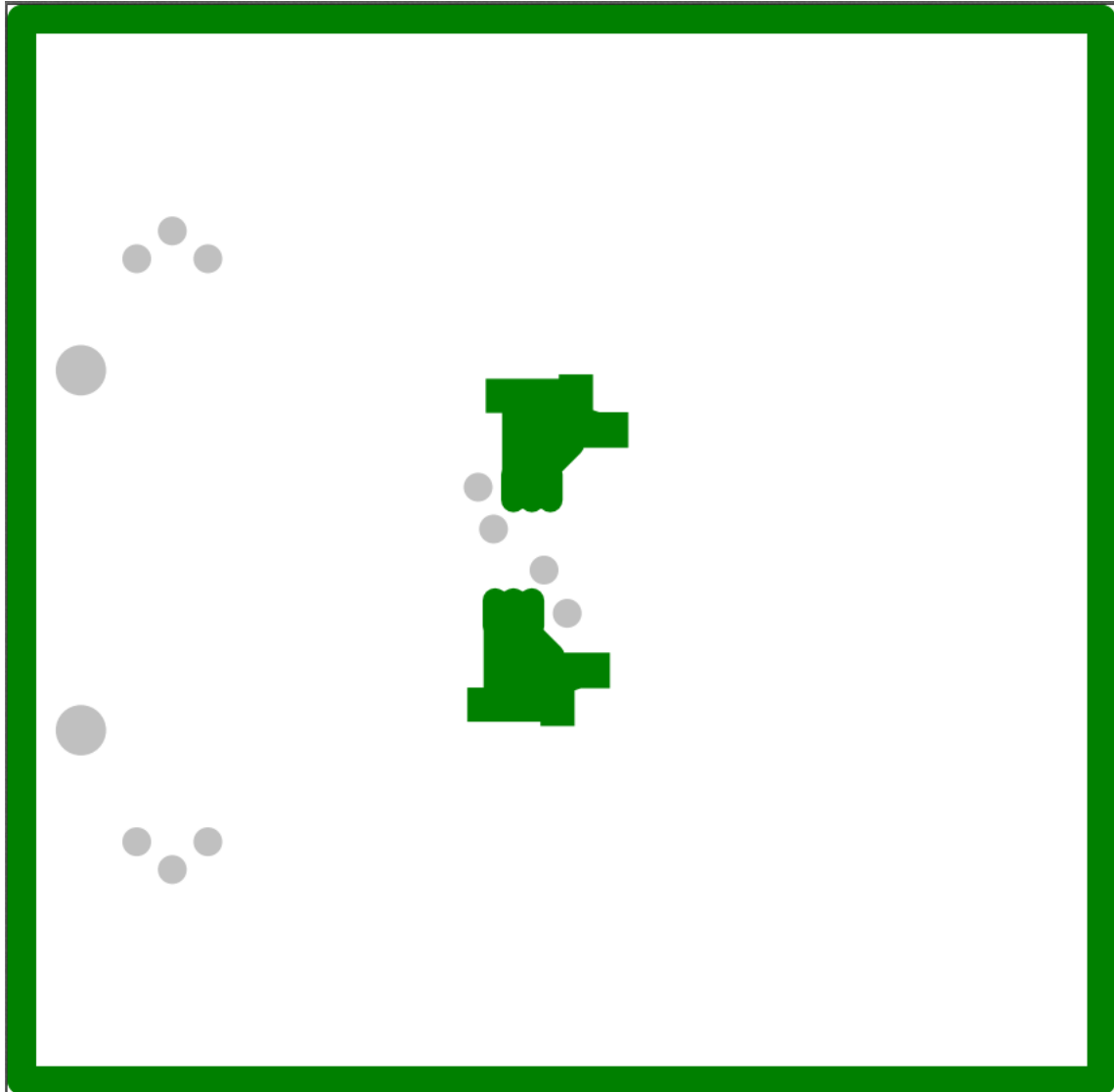


Figure 5-3. OPA2863DGKEVM Layer 2

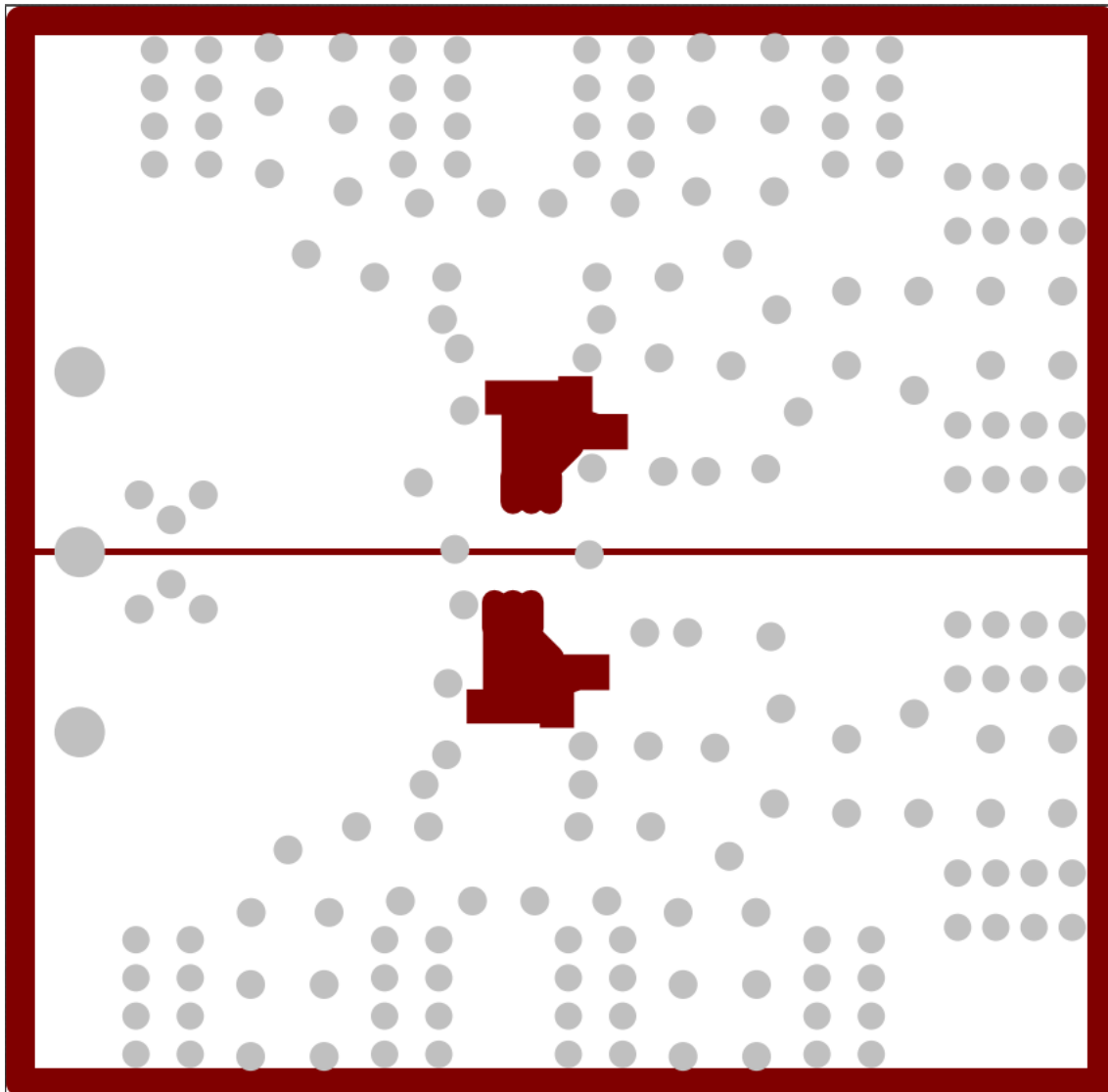


Figure 5-4. OPA2863DGKEVM Layer 3

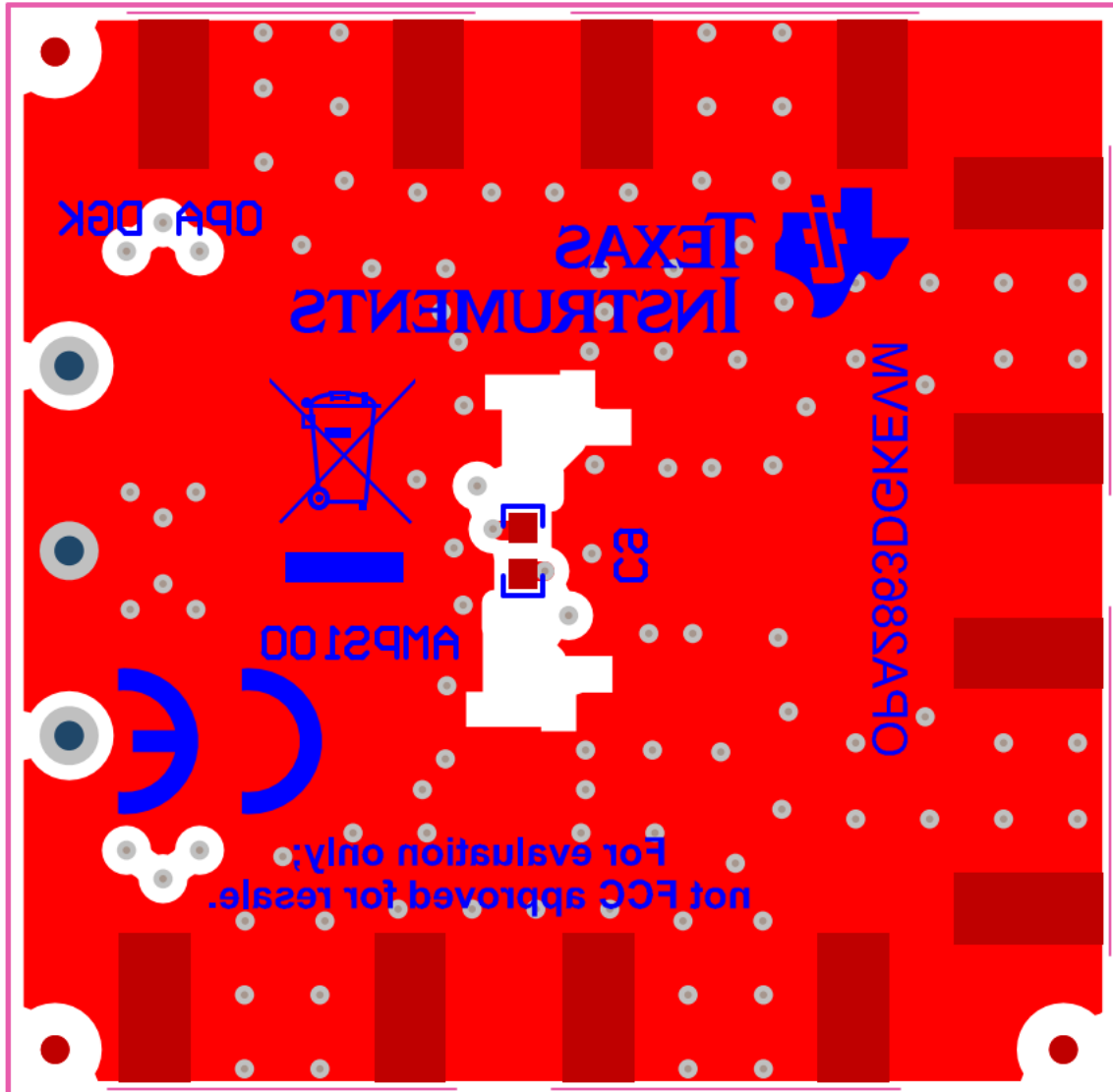


Figure 5-5. OPA2863DGKEVM Bottom Layer

5.3 PCB 3D render

Figure 5-6 and Figure 5-7 show the 3D renders of the PCB.

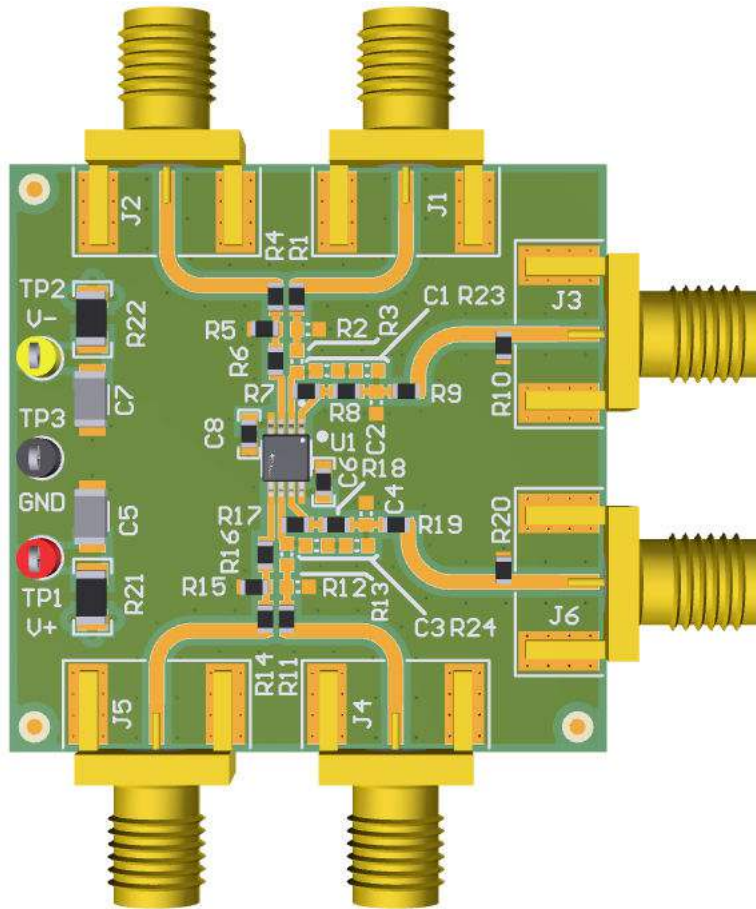


Figure 5-6. OPA2863DGKEVM 3D Render - Top

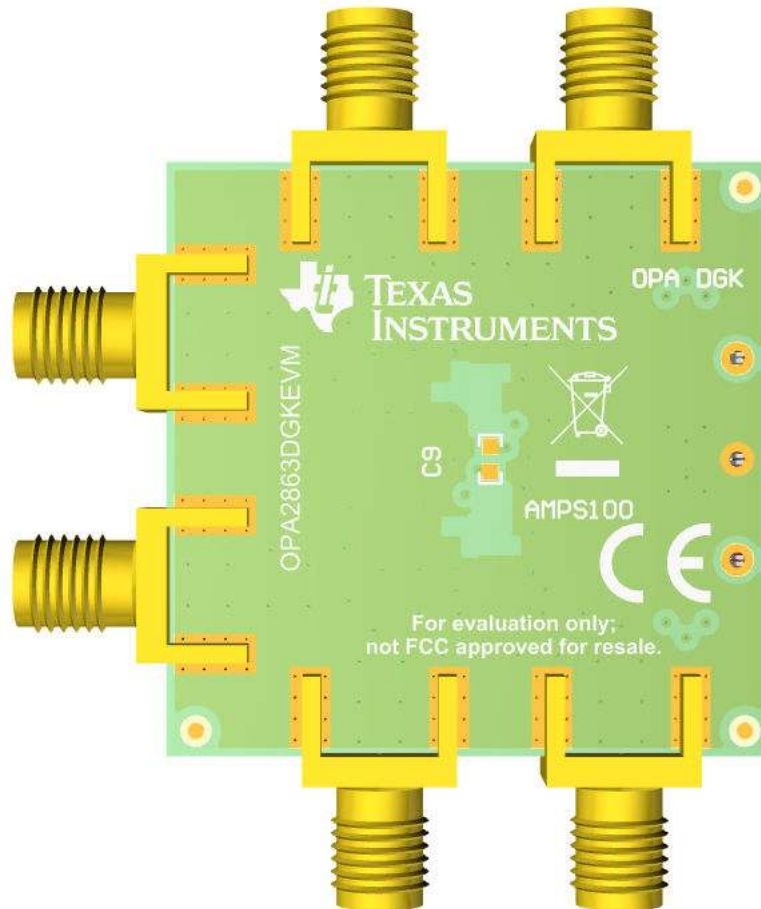


Figure 5-7. OPA2863DGKEVM 3D Render - Bottom

5.4 Bill of Materials

Table 5-1 lists the EVM bill of materials.

Table 5-1. OPA2863DGKEVM Bill of Materials

Item	Part Reference	QTY	Part Number	Manufacturer	Description
1	C5, C7	2	C1206C106J3RACAUTO	Kemet	CAP, CERM, 10 μ F, 25 V, \pm 5%, X7R, 1206
2	C6, C8	2	C0603H103J3GACTU	Kemet	CAP, CERM, 0.01 μ F, 25 V, \pm 5%, C0G/NP0, 0603
3	J1, J2, J3, J4, J5, J6	6	142-0701-851	Cinch Connectivity	Connector, End launch SMA, 50 ohm, SMT
4	R1, R4, R6, R9, R11, R14, R16, R19	8	CRCW06030000Z0EA	Vishay-Dale	RES, 0, 5%, 0.1 W, 0603
5	R2, R12	2	RC0603FR-0752R3L	Yageo	RES, 52.3, 1%, 0.1 W, 0603
6	R5, R15	2	RC0603FR-0749R9L	Yageo	RES, 49.9, 1%, 0.1 W, 0603
7	R7, R17	2	RG1608P-101-B-T5	Susumu Co Ltd	RES, 100, 0.1%, 0.1 W, 0603
8	R8, R18	2	CRCW06031K96FKEA	Vishay-Dale	RES, 1.96 k, 1%, 0.1 W, 0603
9	R10, R20	2	CRCW060351R1FKEA	Vishay-Dale	RES, 51.1, 1%, 0.1 W, 0603
10	R21, R22	2	RC1206JR-070RL	Yageo America	RES, 0, 5%, 0.25 W, 1206
11	TP1	1	5000	Keystone	Test Point, Miniature, Red, TH
12	TP2	1	5004	Keystone	Test Point, Miniature, Yellow, TH
13	TP3	1	5001	Keystone	Test Point, Miniature, Black, TH
14	U1	1	OPA2863DGK	Texas Instruments	OPA2863DGK, DGK (VSSOP-8)

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