

# OPA2835DGS, OPA2836DGS EVM

The OPA2835DGS EVM is an evaluation module for the dual, OPA2835 in the DGS (10-lead MSOP) package.

The OPA2836DGS EVM is an evaluation module for the dual, OPA2836 in the DGS (10-lead MSOP) package.

The OPA2835DGS and OPA2836DGS EVMs are designed to quickly demonstrate the functionality and versatility of the amplifier(s). The EVM is ready to connect to power, signal source, and test instruments through the use of on-board connectors. The default amplifier configuration is non-inverting gain of 2 configuration and split supply. It can be easily configured for other gains, and single supply operation.

### 1 Features

- · Configured for split supply operation and modified for single supply
- Default non-inverting gain of 2 configuration can be reconfigured for other gains
- Designed for connection to standard 50-Ω input/output impedance test equipment
- · Inputs and Outputs include SMA connectors

### 2 EVM Specifications

This section gives a general description of the OPA2835DGS and OPA2836DGS EVMs.

Parameters	MIN	TYP	MAX	
Single Supply voltage range (V <sub>S</sub> - = ground )		2.5V		5.5V
Split Supply voltage range (V <sub>S</sub> ±)		±1.25V		±2.75V
Cumply ourrent I	OPA2835DGS		250µA/amp	
Supply current, I <sub>S</sub>	OPA2836DGS		1mA/amp	
Input voltage, V <sub>I</sub>				V <sub>S</sub> ±
Output drive I with 12.51/ or 51/ Supply	OPA2835DGS		±40mA	
Output drive, I <sub>o</sub> with ±2.5V or 5V Supply	OPA2836DGS		±50mA	



#### 2.1 Power Connections

The OPA2835DGS and OPA2836DGS EVMs are equipped with banana jacks for easy connection of power. The positive supply input is labeled  $V_s$ +. The Negative supply input is labeled  $V_s$ -. Ground is labeled GND.

### 2.1.1 Split Supply Operation

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

### 2.1.2 Single Supply Operation

To operate single supply, jumper  $V_s$ — to GND and apply the positive supply voltage to  $V_s$ +. Inputs and outputs must be biased per data sheet specifications for proper operation.

## 2.2 Input and Output Connections

The OPA2835DGS and OPA2836DGS EVMs are equipped with SMA connectors for easy connection of signal generators and analysis equipment. As shipped the EVMs are configure for non-inverting gain of 2 configuration and split supply with termination for connection to  $50-\Omega$  test equipment. For best results, signals should be routed to and from the EVM with cables having  $50-\Omega$  characteristic impedance. See the OPA2835 data sheet (SLOS713) and the OPA2836 data Sheet (SLOS712), and schematics and layouts for details on how to reconfigure for other gain configurations.

### 3 EVM Schematic, Layout, and Bill of Material (BOM)

This section provides a complete schematic diagram, board layouts, and bill of materials for the OPA2835DGS and OPA2836DGS EVMs.



### 3.1 EVM Schematic

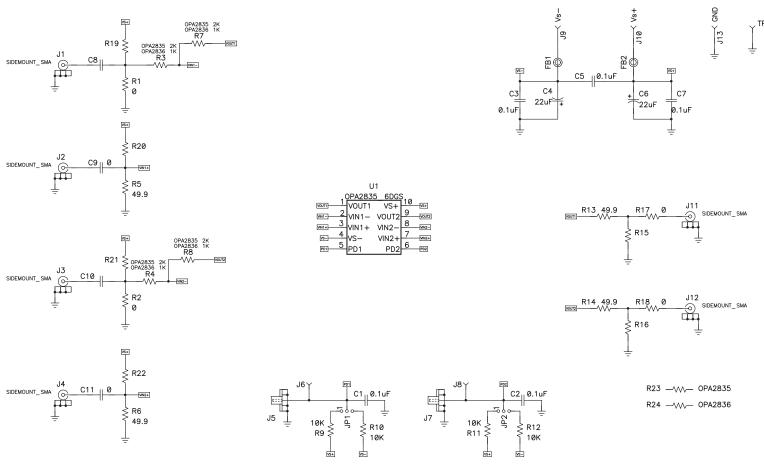


Figure 1. OPA2835DGS and OPA2836DGS EVM Schematic



## 3.2 EVM Layers

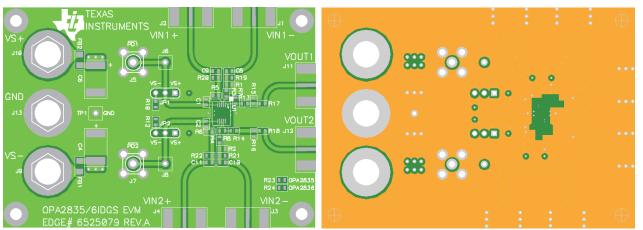


Figure 2. Top Layer

Figure 3. Layer 2

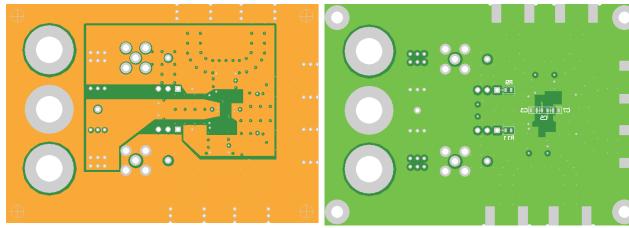


Figure 4. Layer 3

Figure 5. Bottom Layer



#### 3.3 Bill of Materials

### Table 1. OPA2835DGS EVM Bill of Materials

Item	Description	SMD Size	Reference Designator	PCB Qty	Manufacturer's Part Number	Distributor's Part Number
1	BEAD, FERRITE, 3A, 80 OHM	1206	FB1, FB2	2	(STEWARD) HI1206N800R-10	(DIGI-KEY) 240-2409-1-ND
2	CAP, 22.0uF, TANTALUM, 10%, 16V	D	C4, C6	2	(AVX) TAJD226KO16RNJ	(DIGI-KEY) 478-3922-1-ND
3	CAP, 0.1uF, CERAMIC, 50V, X7R	0603	C1, C2, C3, C5, C7	5	(AVX) 06035C104KAT2A	(DIGI-KEY) 478-5052-1-ND
4	OPEN	0603	C8, C10	2		
5	OPEN	0603	R15, R16, R19, R20, R21, R22, R24	7		
6	RESISTOR, 0 OHM,	0603	C9, C11, R1, R2, R17, R18, R23	7	(ROHM) MCR03EZPJ000	(DIGI-KEY) RHM0.0GCT-ND
7	RESISTOR, 49.9 OHM, 1/10W, 1%	0603	R5, R6, R13, R14	4	(ROHM) MCR03EZPFX49R9	(DIGI-KEY) RHM49.9HCT-ND
8	RESISTOR, 2.00K OHM, 1/10, 1%	0603	R3, R4, R7, R8	4	(ROHM) MCR03EZPFX2001	(DIGI-KEY) RHM2.00KHCT-ND
9	RESISTOR, 10K OHM,	0603	R9, R10, R11, R12	4	(ROHM) MCR03EZPFX1002	(DIGI-KEY) RHM10.0KHCT-ND
10	CONN, JACK, BANANA, UNINS		J9, J10, J13	3	(EMERSION) 108-0740-001	(DIGI-KEY) J147-ND
11	CONNECTOR, EDGE, SMA PCB JACK		J1, J2, J3, J4, J11, J12	6	(JOHNSON) 142-0701-801	(DIGI-KEY) J502-ND
12	CONNECTOR, STRAIGHT, SMA		J5, J7	DNI	(AMPHENOL) 901-144-8RFX	(DIGI-KEY) ARFX1231-ND
13	TEST POINT, BLACK		TP1	1	(KEYSTONE) 5001	(DIGI-KEY) 5001K-ND
14	TEST POINT, RED		J6, J8	2	(KEYSTONE) 5000	(DIGI-KEY) 5000K-ND
15	HEADER, 0.1" CTRS, 0.025" SQ. PINS	3 POS.	JP1, JP2	2	(SULLINS) PBC36SAAN	(DIGI-KEY) S1011E-36-ND
16	SHUNTS		JP1, JP2	2	(SULLINS) SSC02SYAN	(DIGI-KEY) S9002-ND
17	IC, OPA2835IDGS		U1	1	(TI) OPA2835IDGS	
18	STANDOFF, 4-40 HEX, 0.625" LENGTH			4	(KEYSTONE) 1808	(DIGI-KEY) 1808K-ND
19	SCREW, PHILLIPS, 4-40, .250"			4	(BF) PMS4400031PH	(DIGI-KEY) H343-ND
20	BOARD, PRINTED CIRCUIT			1	(TI) EDGE# 6525079	



### Table 2. OPA2836DGS EVM Bill of Materials

Item	Description	SMD Size	Reference Designator	PCB Qty	Manufacturer's Part Number	Distributor's Part Number
1	BEAD, FERRITE, 3A, 80 OHM	1206	FB1, FB2	2	(STEWARD) HI1206N800R-10	(DIGI-KEY) 240-2409-1-ND
2	CAP, 22.0uF, TANTALUM, 10%, 16V	D	C4, C6	2	(AVX) TAJD226KO16RNJ	(DIGI-KEY) 478-3922-1-ND
3	CAP, 0.1uF, CERAMIC, 50V, X7R	0603	C1, C2, C3, C5, C7	5	(AVX) 06035C104KAT2A	(DIGI-KEY) 478-5052-1-ND
4	OPEN	0603	C8, C10	2		
5	OPEN	0603	R15, R16, R19, R20, R21, R22, R23	7		
6	RESISTOR, 0 OHM,	0603	C9, C11, R1, R2, R17, R18, R24	7	(ROHM) MCR03EZPJ000	(DIGI-KEY) RHM0.0GCT-ND
7	RESISTOR, 49.9 OHM, 1/10W, 1%	0603	R5, R6, R13, R14	4	(ROHM) MCR03EZPFX49R9	(DIGI-KEY) RHM49.9HCT-ND
8	RESISTOR, 1.00K OHM, 1/10, 1%	0603	R3, R4, R7, R8	4	(ROHM) MCR03EZPFX1001	(DIGI-KEY) RHM1.00KHCT-ND
9	RESISTOR, 10K OHM,	0603	R9, R10, R11, R12	4	(ROHM) MCR03EZPFX1002	(DIGI-KEY) RHM10.0KHCT-ND
10	CONN, JACK, BANANA, UNINS		J9, J10, J13	3	(EMERSION) 108-0740-001	(DIGI-KEY) J147-ND
11	CONNECTOR, EDGE, SMA PCB JACK		J1, J2, J3, J4, J11, J12	6	(JOHNSON) 142-0701-801	(DIGI-KEY) J502-ND
12	CONNECTOR, STRAIGHT, SMA		J5, J7	DNI	(AMPHENOL) 901-144-8RFX	(DIGI-KEY) ARFX1231-ND
13	TEST POINT, BLACK		TP1	1	(KEYSTONE) 5001	(DIGI-KEY) 5001K-ND
14	TEST POINT, RED		J6, J8	2	(KEYSTONE) 5000	(DIGI-KEY) 5000K-ND
15	HEADER, 0.1" CTRS, 0.025" SQ. PINS	3 POS.	JP1, JP2	2	(SULLINS) PBC36SAAN	(DIGI-KEY) S1011E-36-ND
16	SHUNTS		JP1, JP2	2	(SULLINS) SSC02SYAN	(DIGI-KEY) S9002-ND
17	IC, OPA2836IDGS		U1	1	(TI) OPA2836IDGS	
18	STANDOFF, 4-40 HEX, 0.625" LENGTH			4	(KEYSTONE) 1808	(DIGI-KEY) 1808K-ND
19	SCREW, PHILLIPS, 4-40, .250"			4	(BF) PMS4400031PH	(DIGI-KEY) H343-ND
20	BOARD, PRINTED CIRCUIT			1	(TI) EDGE# 6525079	

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### **EVM Warnings and Restrictions**

It is important to operate this EVM within the input voltage range of 2.5V to 5.5V and the output voltage range of 2.5V to 5.5V.

Exceeding the specified input range may cause unexpected operation and/or irreversible damage to the EVM. If there are questions concerning the input range, please contact a TI field representative prior to connecting the input power.

Applying loads outside of the specified output range may result in unintended operation and/or possible permanent damage to the EVM. Please consult the EVM User's Guide prior to connecting any load to the EVM output. If there is uncertainty as to the load specification, please contact a TI field representative.

During normal operation, some circuit components may have case temperatures greater than 85°C. The EVM is designed to operate properly with certain components above 85°C as long as the input and output ranges are maintained. These components include but are not limited to linear regulators, switching transistors, pass transistors, and current sense resistors. These types of devices can be identified using the EVM schematic located in the EVM User's Guide. When placing measurement probes near these devices during operation, please be aware that these devices may be very warm to the touch.

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