

EVM User's Guide: TLV1872EVM

TLV1872 Evaluation Module

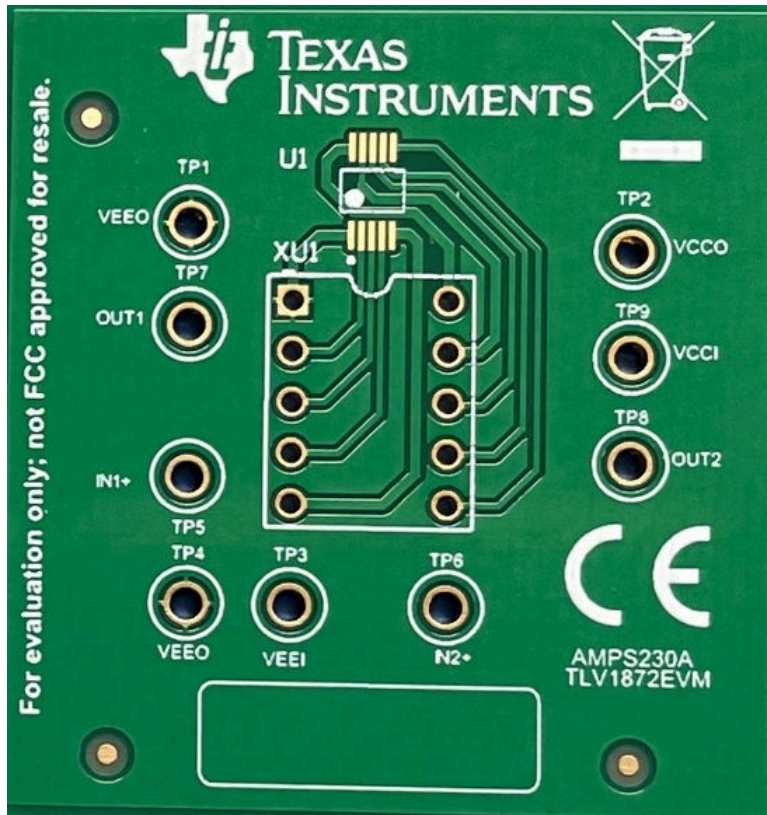


Description

The TLV1872EVM is an evaluation board designed to evaluate the device performance of the 36V high-speed dual channel TLV1872 comparator. The separate input and output supplies allow for split supply capability on the inputs and level shifted outputs for downstream 5V or 3.3V logic devices.

Features

- Low propagation delay
- Low supply current
- Rail-to-rail input
- Separate input and output supplies
- Push-pull output
- Low input offset voltage
- DGS Package 10-pin VSSOP



TLV1872EVM Board (Top View)

1 Evaluation Module Overview

1.1 Introduction

This user's guide describes the functionality and set up procedure of the evaluation board TLV1872EVM, which is designed to evaluate the performance of the 36V high-speed dual channel TLV1872 comparator. Information such as the contents of the kit, specifications of the device, and recommended equipment for the set up is also included.

1.2 Kit Contents

The kit comes with the following:

- 1 x TLV1872EVM

1.3 Specification

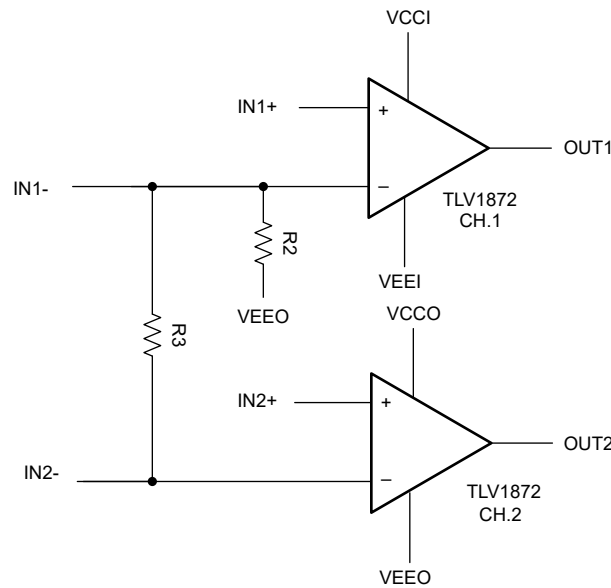


Figure 1-1. TLV1872EVM Block Diagram

- Input supply range (VCCI-VEEI): +2.7 V to +36 V
- Output negative supply voltage (VEEO): VEEI to (VEEI + 18V)
- Output positive supply voltage (VCCO): VEEO + (2.7V to VCCI)
- Input common mode voltage range: (VEEI - 0.2V) to (VCCI + 0.2V)

Table 1-1. TLV1872EVM Test Point to DUT Pin Mapping

TLV3607EVM CONNECTIONS	
Test point 1 and 4 Pin header 1	VEEO (Pin 1)
Test point 7 Pin header 2	OUT1 (Pin 2)
Pin header 3	IN1- (Pin 3)
Test point 5 Pin header 4	IN1+ (Pin 4)
Test point 3 Pin header 5	VEEI (Pin 5)
Test point 6 Pin header 6	IN2+ (Pin 6)
Pin header 7	IN2- (Pin 7)

Table 1-1. TLV1872EVM Test Point to DUT Pin Mapping (continued)

TLV3607EVM CONNECTIONS	
Test point 8 Pin header 8	OUT2 (Pin 8)
Test point 9 Pin header 9	VCCI (Pin 9)
Test point 2 Pin header 10	VCCO (Pin 10)

1.4 Device Information

The following device is used in this evaluation module:

- TLV1872DGSR

2 Hardware

2.1 Recommended Equipment Setup

- Power Supply
- Functional Generator
- Oscilloscope

2.2 Board Setup

2.2.1 Power Supplies

The TLV1872 has separate input and output power supplies: VCCI and VEEI for the input stage and VCCO and VEEO for the output stage. This allows for both single and split supply capabilities for the input stage with ability to level shift in the output stage. The input supply voltage range is 2.7V to 36V where as the output positive supply voltage is VEEO + 2.7V to VCCI.

VCCI, VCCO, VEEI, and VEEO supply voltages can be applied directly to the DIP headers or to the test points TP9, TP2, TP3, and TP4, respectively. Additionally VCCO and VCCI can be tied together through a 0 ohm resistor in R1.

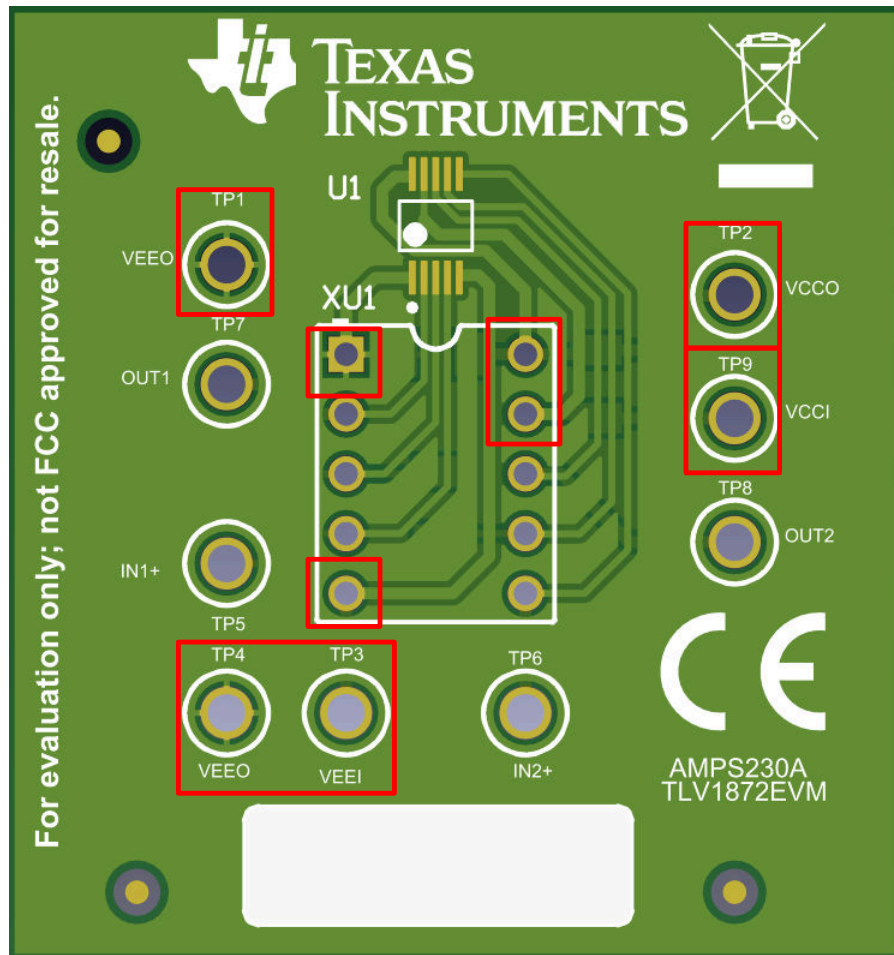


Figure 2-1. TLV1872EVM Power Supplies Connection

2.2.2 Inputs and Outputs

For the non-inverting input terminals (IN1+ and IN2+), the signals can be applied directly the DIP headers or to the test points, TP5 and TP6. For the inverting input terminals (IN1- and IN2-), the signals can be applied to the DIP headers. Additionally, the inverting terminals can be tied together via 0 ohm resistor R3. The inverting terminals can also be tied directly to VEE0 through R2.

The outputs (OUT1 and OUT2) can be measured directly with oscilloscope probes on the DIP headers or through the test points TP7 and TP8.

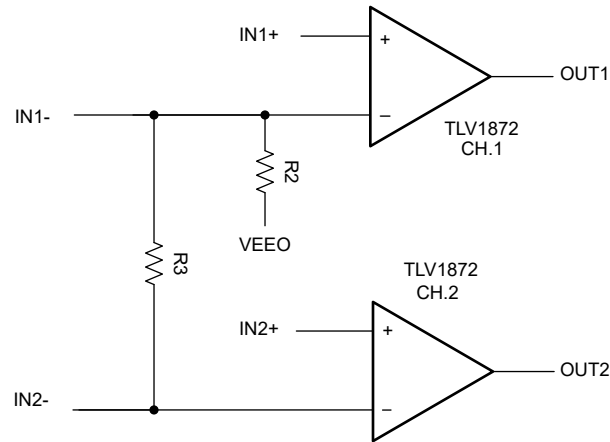


Figure 2-2. Inputs and Outputs Block Diagram

3 Hardware Design Files

3.1 Schematic

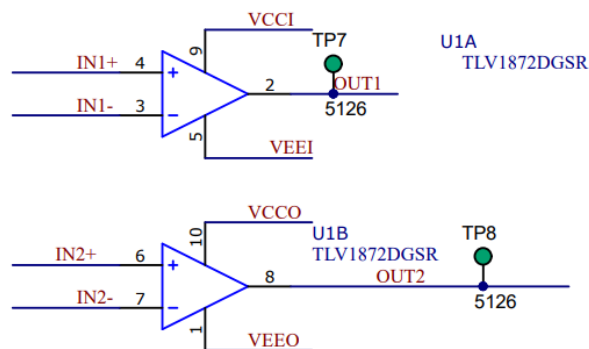
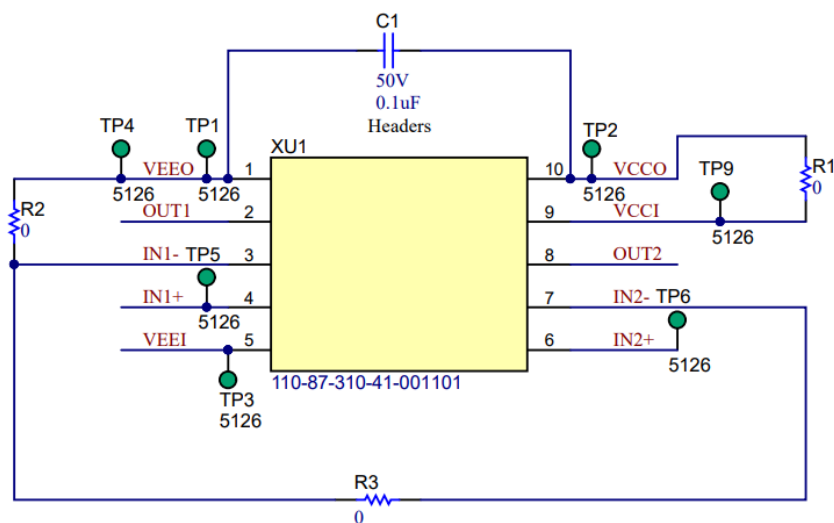
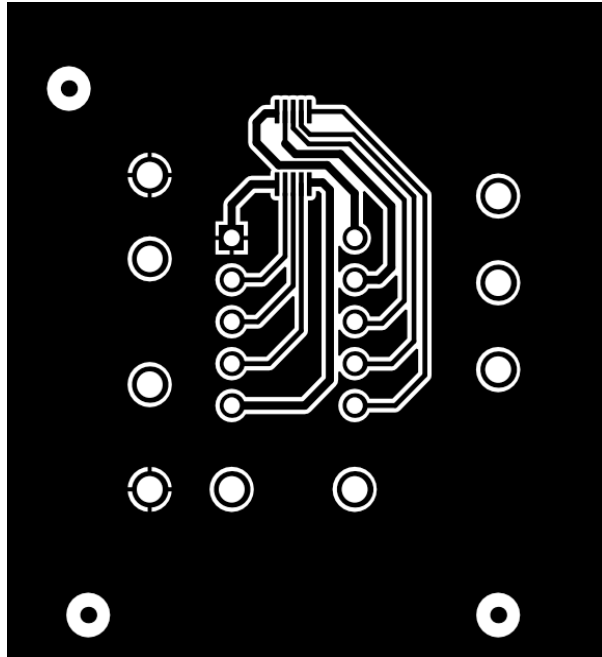
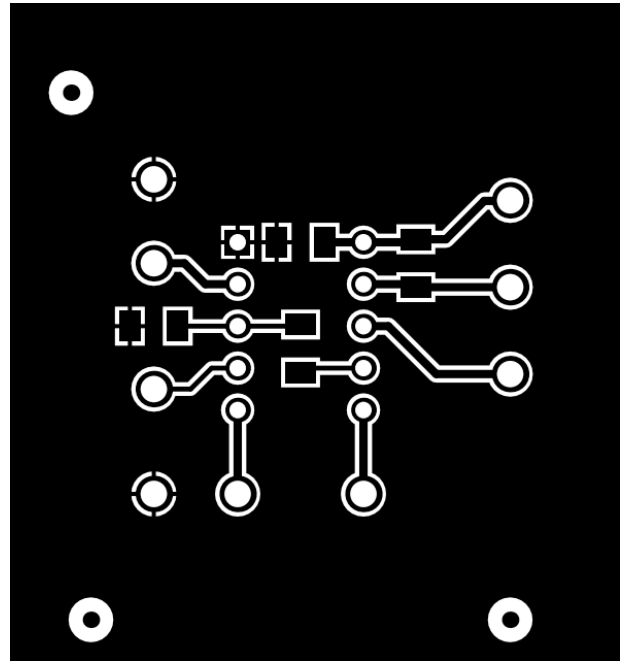


Figure 3-1. TLV1872EVM Schematic

3.2 PCB Layouts



Top Layer



Bottom Layer

Figure 3-2. Layers

3.3 Bill of Materials

Table 3-1. Bill of Materials (BOM)

DESIGNATOR	QTY	VALUE	DESCRIPTION	PART NUMBER	MANUFACTURER	PACKAGE REFERENCE
LBL1	1		Thermal Transfer Printable Labels, 0.650" W x 0.200" H - 10,000 per roll	THT-14-423-10	Brady	PCB Label 0.650 x 0.200 inch
C1	0	0.1uF	CAP, CERM, 0.1uF, 50V, +/- 10%, X7R, 1206	GRM319R71H104KA01D	MuRata	1206
FID1, FID2, FID3, FID4, FID5, FID6	0		Fiducial mark. There is nothing to buy or mount.	N/A	N/A	N/A
R1, R2, R3	0	0	RES, 0, 5%, 0.25 W, 1206	RC1206JR-070RL	Yageo America	1206
TP1, TP2, TP3, TP4, TP5, TP6, TP7, TP8, TP9	0		Test Point, Multipurpose, Green, TH	5126	Keystone Electronics	Green Multipurpose Testpoint
U1	0		36V High-Speed Comparators with Separate Input and Output Supplies	TLV1872DGSR	Texas Instruments	VSSOP10
XU1	0		Socket, DIP-10, 2.54mm Pitch, TH	110-87-310-41-001101	Preci-Dip	Socket, DIP-10, 2.54mm Pitch

4 Additional Information

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NOTE:

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3.1.2 For EVMs annotated as FCC – FEDERAL COMMUNICATIONS COMMISSION Part 15 Compliant:

CAUTION

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

FCC Interference Statement for Class A EVM devices

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

FCC Interference Statement for Class B EVM devices

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

3.2 Canada

3.2.1 For EVMs issued with an Industry Canada Certificate of Conformance to RSS-210 or RSS-247

Concerning EVMs Including Radio Transmitters:

This device complies with Industry Canada license-exempt RSSs. Operation is subject to the following two conditions:

(1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Concernant les EVMs avec appareils radio:

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes: (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Concerning EVMs Including Detachable Antennas:

Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication. This radio transmitter has been approved by Industry Canada to operate with the antenna types listed in the user guide with the maximum permissible gain and required antenna impedance for each antenna type indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

Concernant les EVMs avec antennes détachables

Conformément à la réglementation d'Industrie Canada, le présent émetteur radio peut fonctionner avec une antenne d'un type et d'un gain maximal (ou inférieur) approuvé pour l'émetteur par Industrie Canada. Dans le but de réduire les risques de brouillage radioélectrique à l'intention des autres utilisateurs, il faut choisir le type d'antenne et son gain de sorte que la puissance isotrope rayonnée équivalente (p.i.r.e.) ne dépasse pas l'intensité nécessaire à l'établissement d'une communication satisfaisante. Le présent émetteur radio a été approuvé par Industrie Canada pour fonctionner avec les types d'antenne énumérés dans le manuel d'usage et ayant un gain admissible maximal et l'impédance requise pour chaque type d'antenne. Les types d'antenne non inclus dans cette liste, ou dont le gain est supérieur au gain maximal indiqué, sont strictement interdits pour l'exploitation de l'émetteur.

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<https://www.ti.com/ja-jp/legal/notice-for-evaluation-kits-delivered-in-japan.html>

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1. Use EVMs in a shielded room or any other test facility as defined in the notification #173 issued by Ministry of Internal Affairs and Communications on March 28, 2006, based on Sub-section 1.1 of Article 6 of the Ministry's Rule for Enforcement of Radio Law of Japan,
2. Use EVMs only after User obtains the license of Test Radio Station as provided in Radio Law of Japan with respect to EVMs, or
3. Use of EVMs only after User obtains the Technical Regulations Conformity Certification as provided in Radio Law of Japan with respect to EVMs. Also, do not transfer EVMs, unless User gives the same notice above to the transferee. Please note that if User does not follow the instructions above, User will be subject to penalties of Radio Law of Japan.

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