

TLV40x1EVM

The TLV40x1 devices are MicroPower, high-accuracy comparators with an internal 0.2V or 1.2V reference and propagation delay of 450ns. The comparators are available in an ultra-small, WCSP package measuring 0.73 mm × 0.73 mm. The TLV40x1EVM is intended to make it easier to evaluate or to integrate the device in the user's prototype system.

The EVM is comprised of four identical layouts (quadrants) where a different TLV40x1 device can be installed. For user flexibility, each quadrant can be conveniently detached from the other quadrants by flexing the EVM at the provided scribe lines. The shipped EVM has the TVL4021R1, TLV4031R1, TLV4041R2, and TLV4041R1 installed in quadrants (I to IV) respectively.

The EVM board provides mounting holes which are compatible to an industry standard DIP package. A 8-pin DIP socket, common 0.1 inch pin headers, or wires can be installed depending on the user's integration requirement.

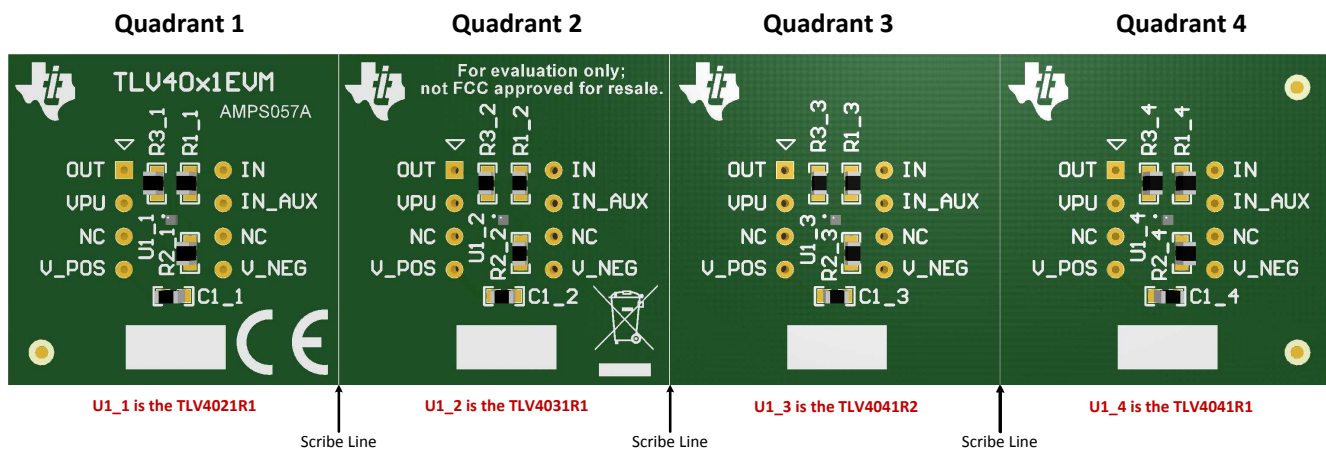


Figure 1. TLV40x1EVM Board Top View

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1 TLV40x1EVM Block Diagram

The block diagram for each Quadrant is identical with each Quadrant having a different TLV40x1 device populated. For example, Quadrant 1 is populated with the TLV4021R1, Quadrant 2 is populated with the TLV4031R1, Quadrant 3 is populated with the TLV4041R2, and Quadrant 4 is populated with the TLV4041R1. See [Table 2](#) for a description of each TLV40x1 family member.

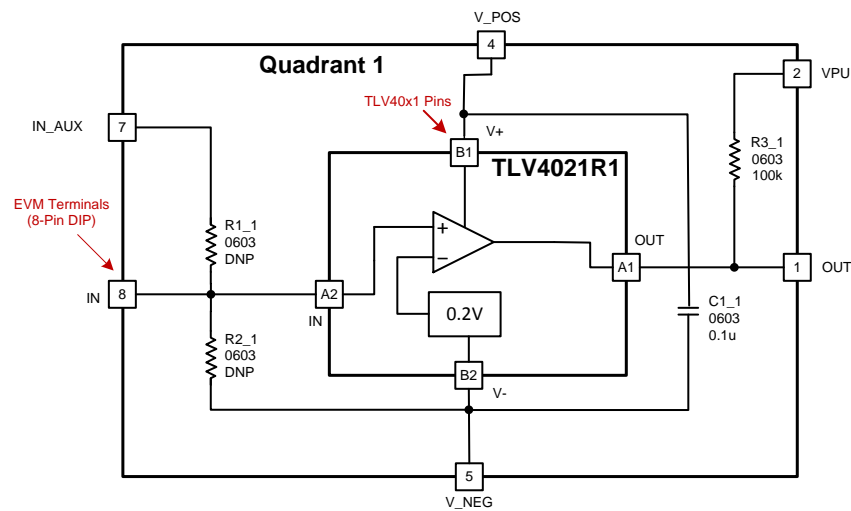


Figure 2. Block Diagram

Table 1. TLV40x1 and EVM "Quadrant" Board Signals

TLV40x1 DEVICE		TLV40x1EVM DIP HOLES	
PIN NUMBER	SIGNAL NAME	PIN NUMBER	SIGNAL NAME
A1	OUT	1	OUT
B1	V+	4	V_POS
B2	V-	5	V_NEG
A2	IN	8	IN
		7	IN_AUX
		2	VPU
		3, 6	No Connection

Table 2. TLV40x1 Truth Table

DEVICE	REFERENCE VOLTAGE	INPUT CONFIGURATION	OUTPUT TOPOLOGY
TLV4021R2 TLV4021R1	0.2V 1.2V	Non-Inverting	Open-Drain
TLV4031R2 TLV4031R1	0.2V 1.2V	Inverting	Open-Drain
TLV4041R2 TLV4041R1	0.2V 1.2V	Non-Inverting	Push-Pull
TLV4051R2 TLV4051R1	0.2V 1.2V	Inverting	Push-Pull

2 How to Use the TLV40x1EVM for Evaluation or System Prototypes

The TLV40x1EVM quadrant is assembled with the TLV40x1 device, a 0.1 μF ceramic capacitor (in 0603 package), and a 100 kΩ pull-up resistor (only for Quadrants I & II). If the application needs to scale down the input voltage to a lower value, a pair of resistors R1 and R2 can be installed by the user. In this case, connect the voltage to be monitored to IN_AUX (DIP PIN 7) instead of IN (DIP PIN 8).

Depending on the user's setup or requirement, a standard 8-pin DIP socket or 0.1-inch pin headers may be installed. Users may also solder wires directly to the DIP holes.

2.1 Usage Example

[Figure 3](#) shows a typical use case of TLV4021R1 as an undervoltage monitor. Resistors R1 and R2 need to be installed on the EVM and the voltage to be monitored is applied to IN_AUX (DIP PIN 7). The configuration detects an undervoltage condition when the input voltage at IN_AUX drops below 2 V. The output pull-up resistor R3 is connected to a 1.8 V supply through VPU (DIP PIN2). The example assumes that the logic device that is connected to the output of the comparator operates at 1.8 V.

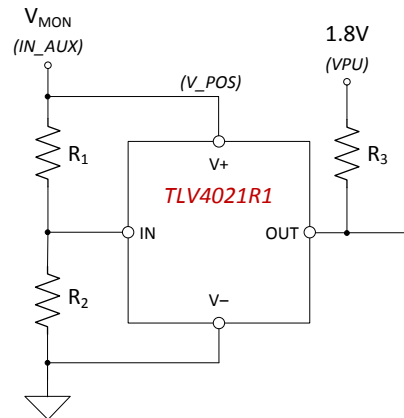


Figure 3. Usage Example

Listed below is the equation for deriving values for R1 and R2. For more details on this application, please refer to the Applications Section of the TLV4021 datasheet

$$R_1 = \frac{(V_{TH} - V_{IT-})}{V_{IT-}} \times R_2 \quad (1)$$

3 TLV40x1EVM Schematic

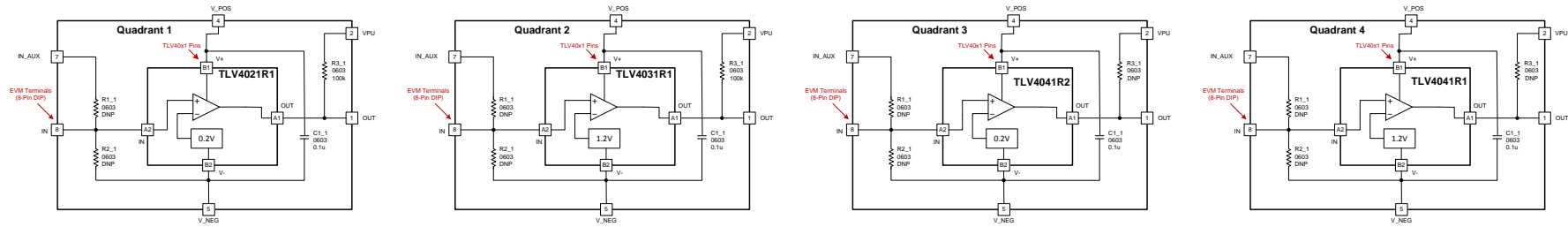


Figure 4. TLV40x1EVM Schematic

Revision History

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

Changes from Original (September 2019) to A Revision

Page

- Changed the BOM for the EVM. All 4 Quadrants are now populated with different devices from the TLV40x1 family..... 2
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