2N7001T Evaluation Module

This user's guide describes the characteristics, operation, and use of the 2N7001TEVM Evaluation Module (EVM). The complete printed-circuit board (PCB) layout, schematic diagram, and bill of materials are included in this document.

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1 Introduction

The 2N7001T is a new single bit, unidirectional voltage translator from Texas Instruments. It uses two individually configurable power-supply rails which can be configured from 1.65 V to 3.6 V. This makes the 2N7001T suitable for translation between 1.8 V, 2.5 V, and 3.3 V. The 2N7001TEVM enables the evaluation of this single bit voltage translator.

1.1 Features

The 2N7001T has two configurable supply pins that allow it to up-translate or down-translate from 1.65 V to 3.6 V. The A input pin has thresholds defined by the V_{CCA} pin. The B output pin has thresholds defined by the V_{CCB} pin. The glitch-free power sequence allows the two supplies to be ramped up or down, in any order, without causing a glitch on the I/Os. An example of this is when an output waveform momentarily transitions from Logic Low to Logic High during device power up. Glitches like this can be misinterpreted by a peripheral as a valid data bit which can trigger a false reset, failed configuration, or invalid data initialization.

The 2N7001T is specified for partial-power-down applications using I_{OFF}. The I_{OFF} circuitry disables the output which prevents current back flow through the device. This prevents the device from being damaged when powered down. The V_{CC} isolation feature ensures that if either V_{CC} supplies is at 100 mV or less, then the output on Pin B is in a high-impedance state.

This EVM is designed to support the 2N7001T in DCK and DPW packages. For more information on the DPW package, see the *Designing and Manufacturing with TI's X2SON Packages* application report.

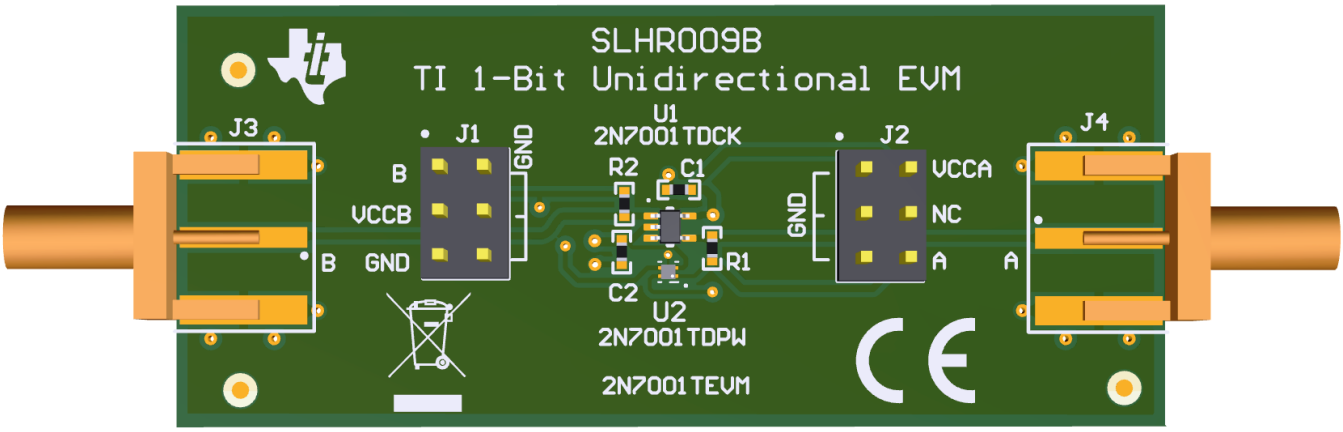


Figure 1. 2N7001TEVM Board

1.2 Hardware Description

1.2.1 Passive Components

The 2N7001TEVM has several passive components located on the board. C1 and C2 are 0.1 µF bypass capacitors for V_{CCA} and V_{CCB}. R1 and R2 are 0 Ω jumper resistors. These resistors can be removed to isolate the I/O of the 2N7001TDPWR device from the SMB connectors (J3 and J4) and the 2N7001TDCKR I/O device from the headers (J1 and J2). By default, these resistors are populated to ensure both devices share inputs and outputs to both the SMB connectors and headers.

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1.2.2 Headers

The EVM has standard 100-mil headers (J1 and J2) with the side that is closer to the device connected to ground. Shown in Figure 1, the side that is farther away from the device is routed to the device pinout for easier connection. The silkscreen indicates the pin function. These headers are used to apply the V_{CCA} and V_{CCB} voltages. Additionally, if R1 and R2 are not populated, these headers will need to be used to input the signal to pin A and measure the output from pin B of the 2N7001TDPWR device. A simplified diagram of header J2 is shown in Figure 2 to show what each pin is connected to.

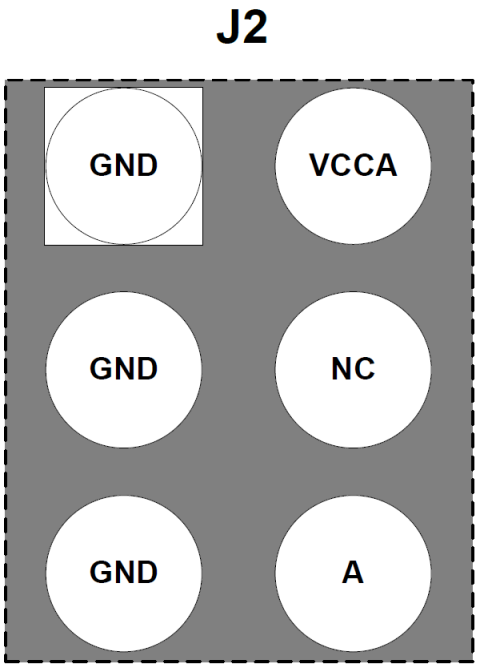


Figure 2. J2 Header Simplified Diagram

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2 Board Layout

Figure 3 shows the 2N7001TEVM layout.

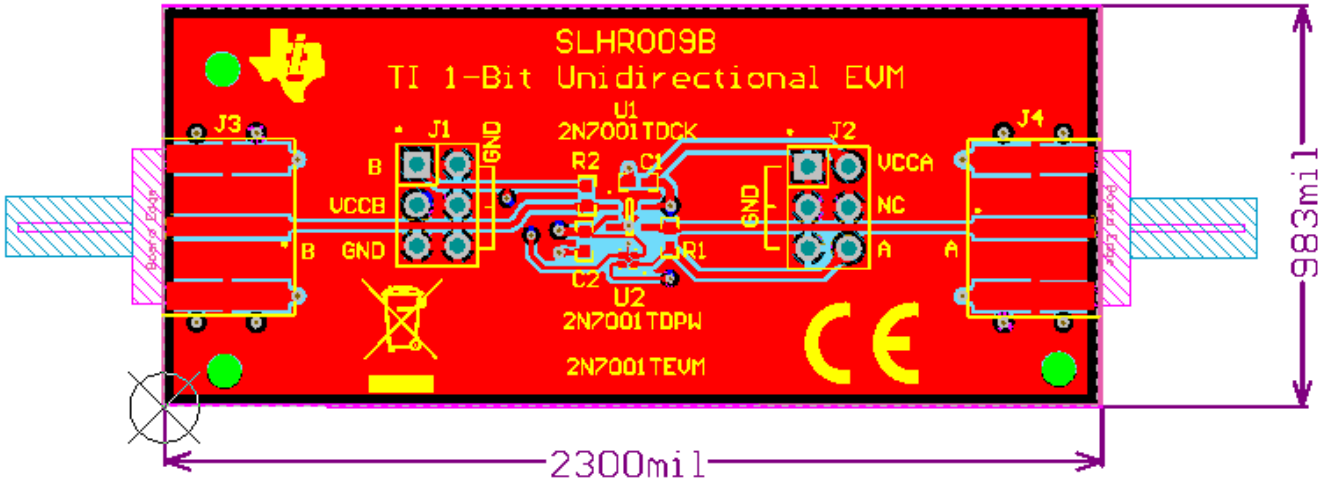


Figure 3. 2N7001TEVM Layout

3 Schematic and Bill of Materials

3.1 Schematic

Figure 4 shows the 2N7001TEVM schematic. The schematic includes the DCK and DPW package devices.

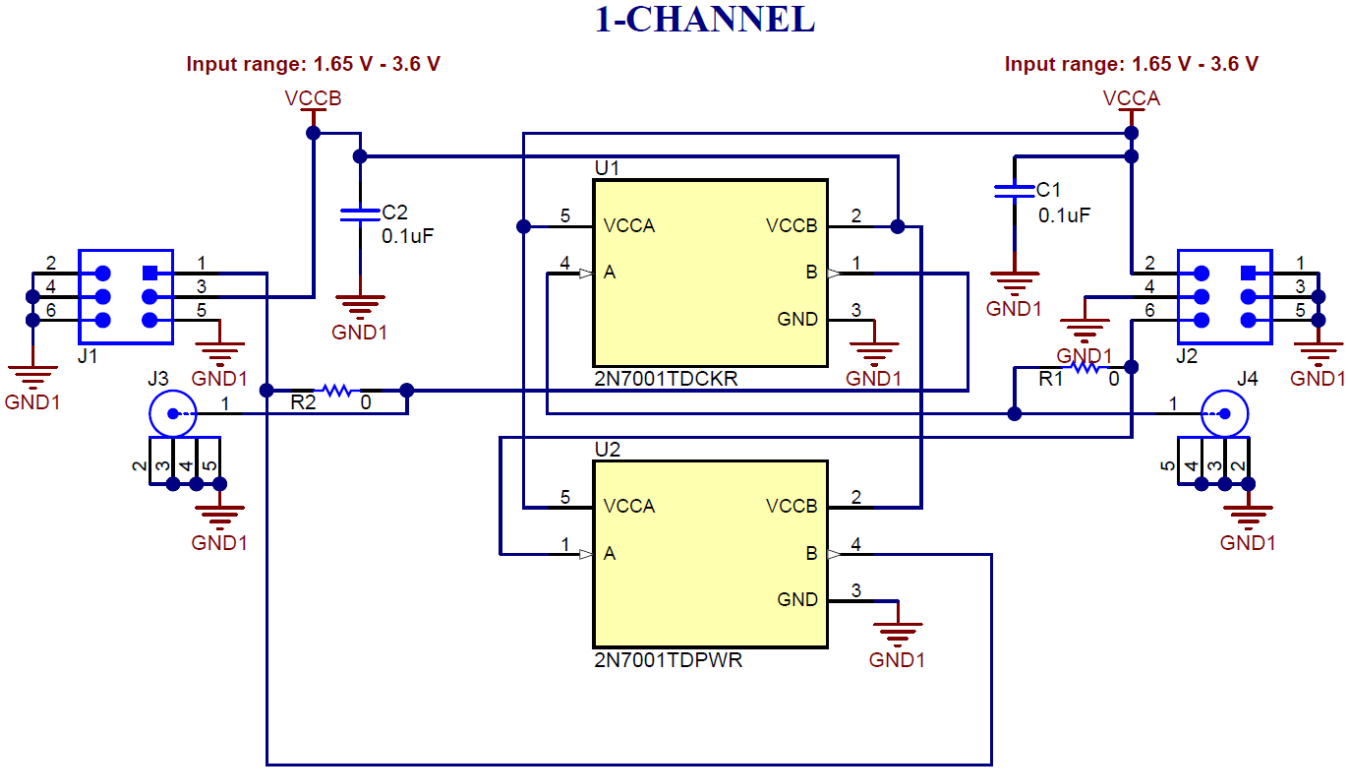


Figure 4. 2N7001TEVM Schematic

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3.2 Bill of Materials

Table 1 lists the 2N7001TEVM bill of materials.

Table 1. Bill of Materials

Designator	Qty	Value	Description	Package Reference	Part Number	Manufacturer
C1, C2	2	0.1uF	CAP, CERM, 0.1 uF, 16 V, +/- 10%, X7R, 0402	0402	0402YC104KAT2A	AVX
J1, J2	2		Header, 100mil, 3x2, Gold, TH	3x2 Header	TSW-103-07-G-D	Samtec
J3, J4	2		Connector, SMB Jack, End launch, SMT	SMB End launch Jack, SMT	131-3701-801	Cinch Connectivity
R1, R2	2	0	RES, 0, 5%, 0.063 W, 0402	0402	ERJ-2GE0R00X	Panasonic
U1	1		1-Bit Dual-Supply Buffered Voltage Signal Converter, DCK0005A (SOT-SC70-5)	DCK0005A	2N7001TDCKR	Texas Instruments
U2	1		1-Bit Dual-Supply Buffered Voltage Signal Converter, DPW0005A (X2SON-5)	DPW0005A	2N7001TDPWR	Texas Instruments

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- *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.*

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