

TXGx04x 4-Channel Ground-Level Translator Evaluation Module

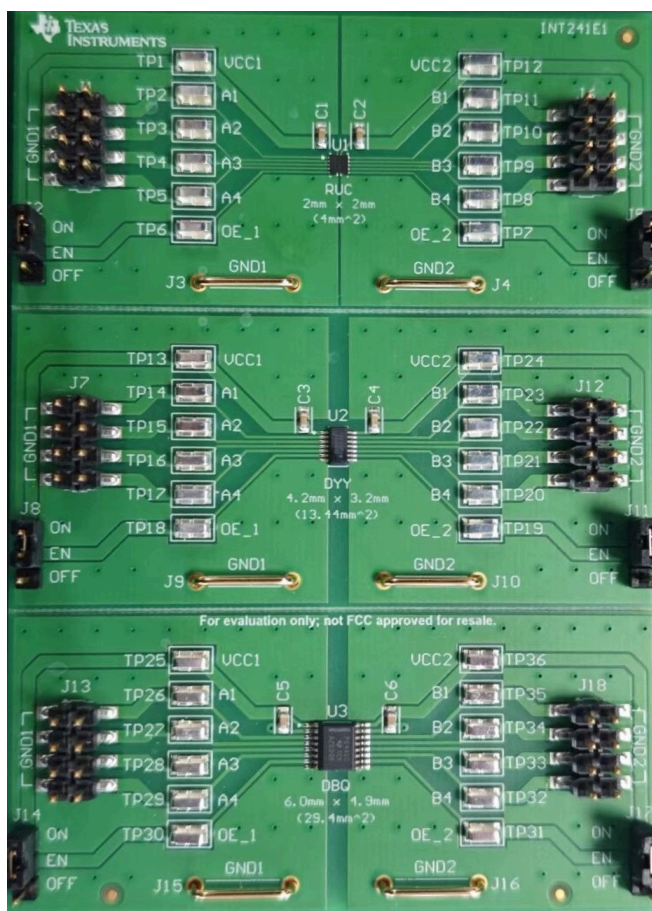


Description

TXG-4CH-EVM is an evaluation module (EVM) used to evaluate the TXGx04x 4-channel ground-level translator product family. The EVM supports multiple package options, which include 16-pin DBQ, 14-pin DYY, and 14-pin RUC. The EVM features multiple test points and connection options to evaluate the device.

Features

- 1.71V to 5.5V supply voltage
- GND shift tolerance up to $\pm 80V$
- Supports up to 250Mbps
- Power supply bypass capacitors
- Test points and connection pins



1 Evaluation Module Overview

1.1 Introduction

This user's guide describes evaluation module (EVM) operation for the TXGx04x four-channel ground-level translators. This guide also describes the EVM schematic and typical laboratory setup for evaluation as well as the typical input and output waveform.

1.2 Kit Contents

This evaluation module contains one PCB and three TXG4041 ICs with three package options. The major components of the TXG-4CH-EVM are:

- TXG ground-level translators
- On-board test points and connections for each device pin
- Power supply bypass capacitors

1.3 Specification

The TXGx04x is a 4-bit ground-level translator that uses two individually configurable power-supply rails which allows the TXGx04x to translate across two different power domains. The device is operational with V_{CCA} and V_{CCB} supplies as low as 1.71V and as high as 5.5V. The A port is designed to track V_{CCA} and the B port is designed to track V_{CCB} . In addition to I/O level shifting, these translators can support a difference up to $\pm 80V$ between GNDA and GNDB. V_{CCA} is referenced to GNDA and V_{CCB} is referenced to GNDB.

1.4 Device Information

The evaluation module contains three TXG4041 with various package options, a series of different connections and test points to help evaluate the device, and a small network of power supply bypass capacitors. All of the items are recommended for proper evaluation of the TXGx04x product family. If necessary, any of the EVM components can be removed, added, or replaced to modify the evaluation conditions of the device.

For a full list of components included in the TXG-4CH-EVM, please see [Table 3-1](#).

2 Hardware

2.1 Pin Configuration of TXGx04x products

Figure 2-1 shows the pin configuration of TXGx041 and TXGx042. This EVM gives the capability to sample any TXG 4-channel product regardless of package or configuration.

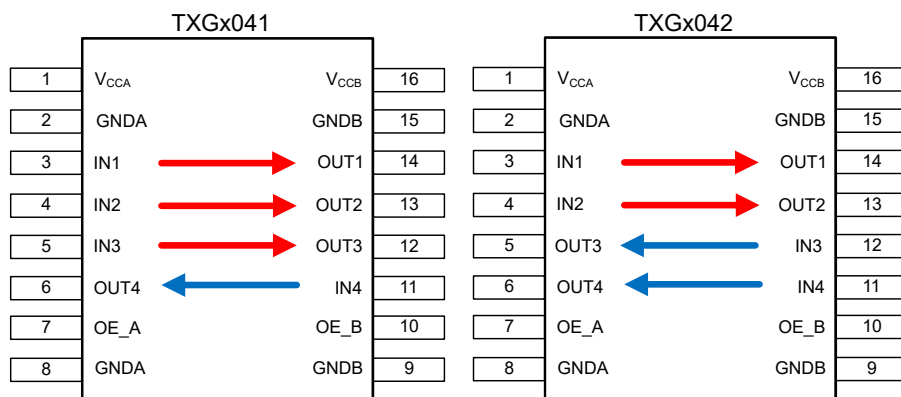


Figure 2-1. TXG-4CH-EVM Top Side

2.2 EVM Block Diagram and Image

Figure 2-2 shows the top view of the EVM PCB.

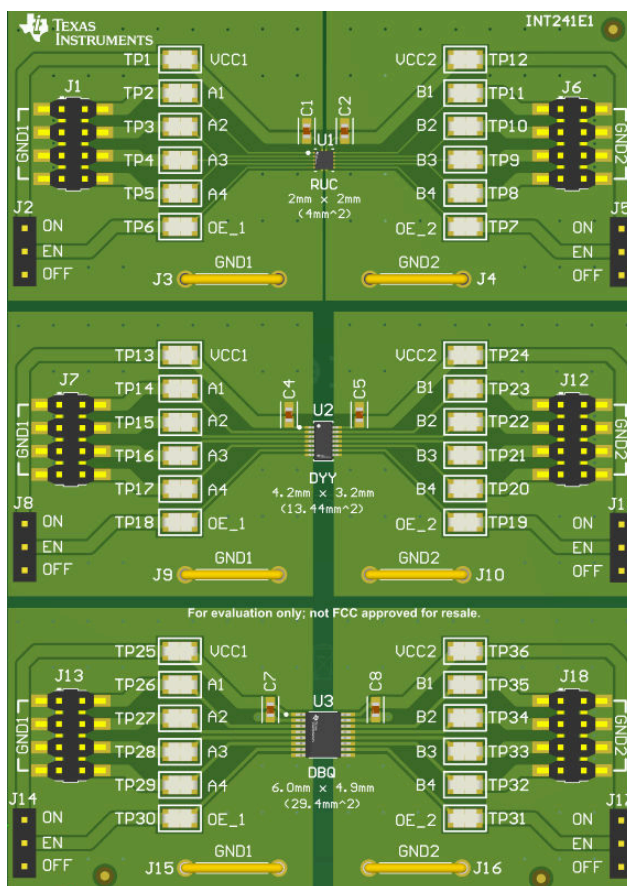


Figure 2-2. TXG-4CH-EVM 3D Diagram

2.3 EVM Setup and Operation

Section 2.3 describes the setup and operation of the EVM for parameter performance evaluation. Figure 2-3 shows the configuration for operating the TXG-4CH-EVM using two power supplies.

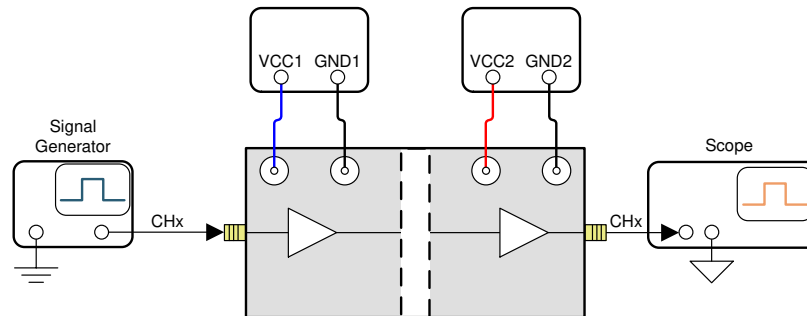


Figure 2-3. Basic EVM Operation

Figure 2-4 shows typical input and output waveforms of the EVM for a 1MHz clock. The input is shown as channel 2, and the output is shown as channel 3.

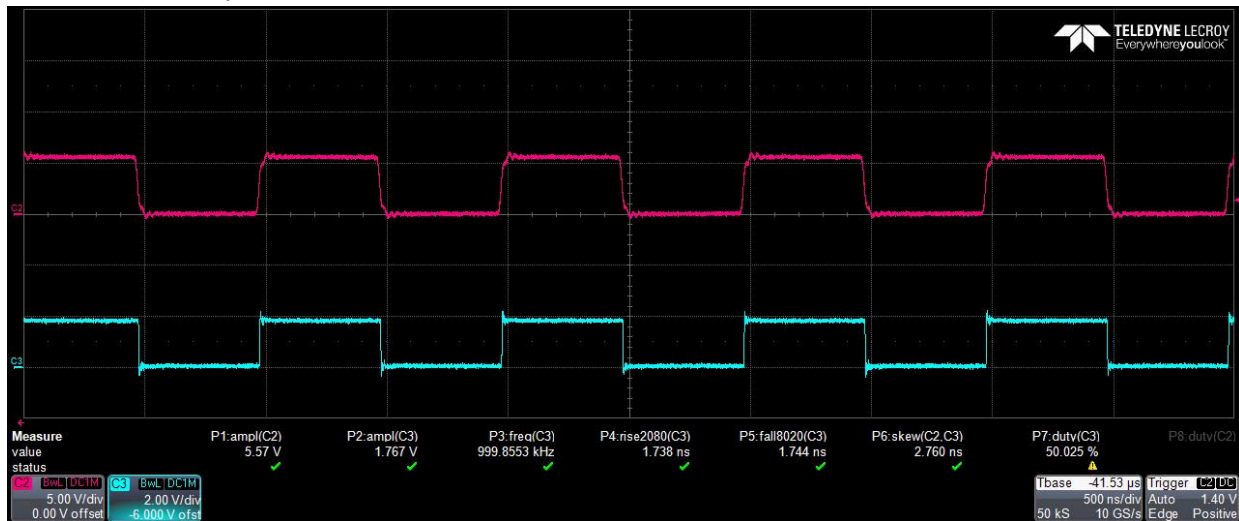


Figure 2-4. Typical Input and Output Waveform

3 Hardware Design Files

3.1 Schematic

Figure 3-1, Figure 3-2, and Figure 3-3 show the TXG-4CH-EVM schematic.

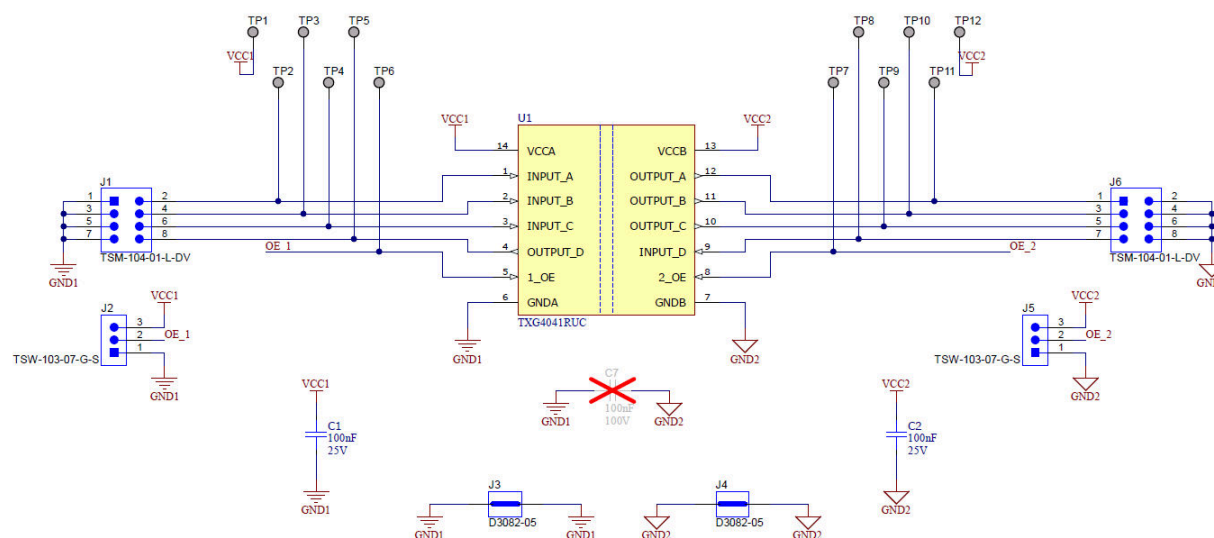


Figure 3-1. TXG-4CH-EVH (RUC) Schematic

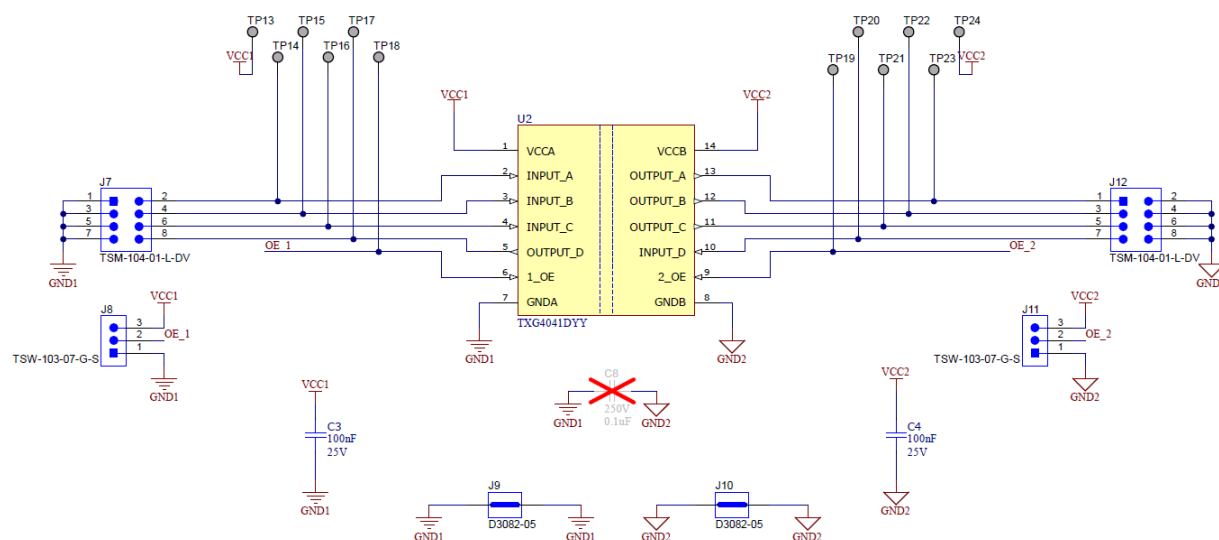


Figure 3-2. TXG-4CH-EVH (DYY) Schematic

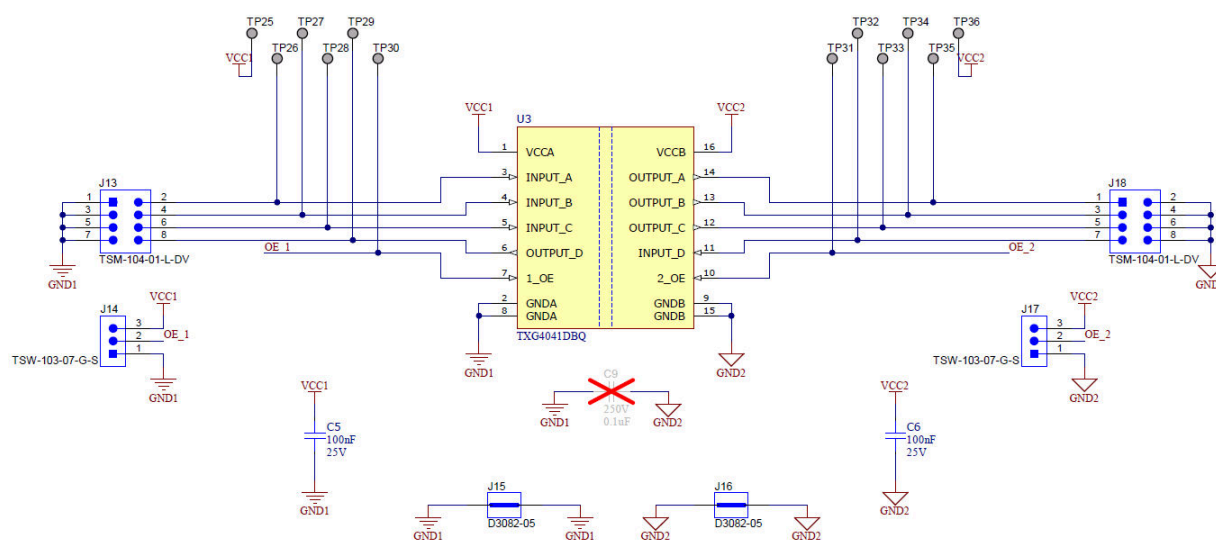


Figure 3-3. TXG-4CH-EVH (DBQ) Schematic

3.2 PCB Layouts

Figure 3-4 and Figure 3-6 show the top and bottom views of the PCB layout of the EVM. Figure 3-5 shows the top layer of the EVM.

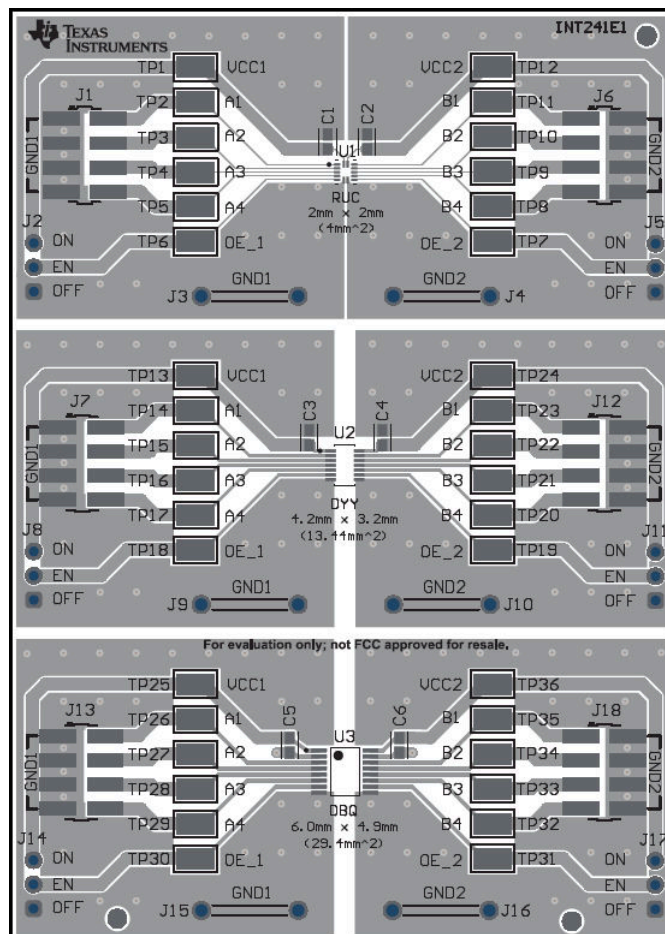


Figure 3-4. TXG-4CH-EVM - Composite Top View

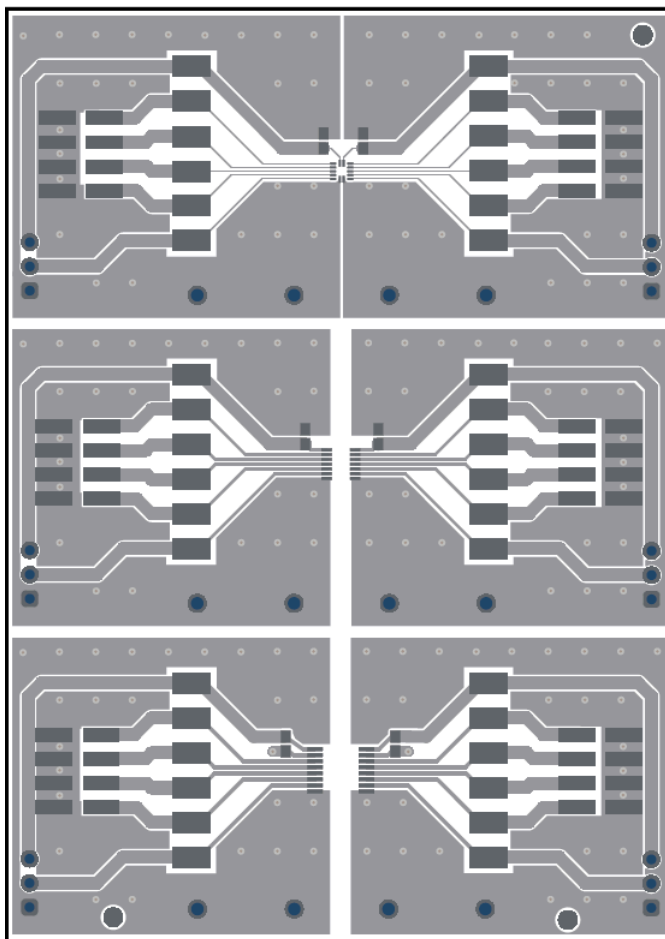


Figure 3-5. TXG-4CH-EVM - Top Layer

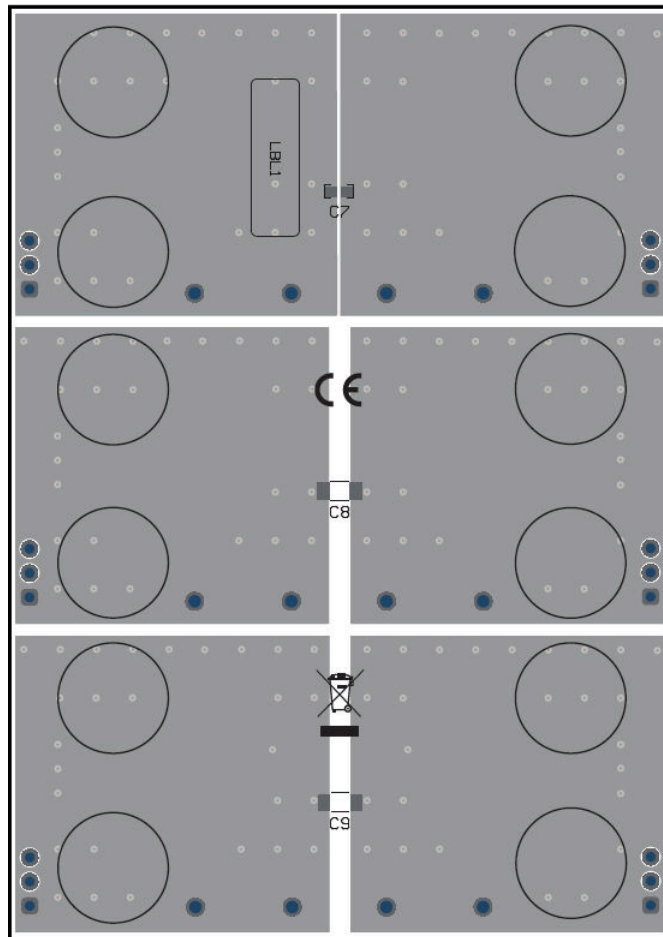


Figure 3-6. TXG-4CH-EVM - Composite Bottom View

3.3 Bill of Materials (BOM)

Table 3-1 shows the bill of materials (BOM) for this EVM.

Table 3-1. Bill of Materials

Designator	Quantity	Description	Manufacturer	Part Number
C1, C2, C3, C4, C5, C6	6	Cap Ceramic 0.1uF 25V X7R 10% SMD 0603 125°C	YAGEO	CC0603KRX7R8BB104
H1, H2, H3, H4, H5, H6, H7, H8, H9, H10, H11, H12	12	Bumpon, Hemisphere, 0.44 X 0.20, Clear	3M	SJ-5303 (CLEAR)
J1, J6, J7, J12, J13, J18	6	Header, 2.54mm, 4x2, Gold, SMT	Samtec	TSM-104-01-L-DV
J2, J5, J8, J11, J14, J17	6	Header, 100mil, 3x1, Gold, TH	Samtec	TSW-103-07-G-S
J3, J4, J9, J10, J15, J16	6	1mm Uninsulated Shorting Plug, 10.16mm spacing, TH	Harwin	D3082-05
TP1, TP2, TP3, TP4, TP5, TP6, TP7, TP8, TP9, TP10, TP11, TP12, TP13, TP14, TP15, TP16, TP17, TP18, TP19, TP20, TP21, TP22, TP23, TP24, TP25, TP26, TP27, TP28, TP29, TP30, TP31, TP32, TP33, TP34, TP35, TP36	36	Test Point, Miniature, SMT	Keystone	5019
U1	1	4-channel ground level translators, 3/1 configuration, RUC	Texas Instruments	TXG4041RUC
U2	1	4-bit ground level translators, 3/1 configuration, DYY	Texas Instruments	TXG4041DYY
U3	1	4-bit ground level translators, 3/1 configuration, DBQ	Texas Instruments	TXG4041DBQ
C7	0	CAP, CERM, 0.1uF, 100V, +/- 10%, X7R, 0603	MuRata	GRM188R72A104KA35D
C8, C9	0	CAP, CERM, 0.1uF, 250V, +/- 10%, X7R, 1206	MuRata	GRM31CR72E104KW03L

4 Additional Information

4.1 Trademarks

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