RS232 BoosterPack™ Getting Started Guide

Meet the BOOSTXL-RS232™ BoosterPack. This BoosterPack provides the opportunity to communicate to and from TI LaunchPads™ using the RS232 serial protocol. The featured product is the TRS3122E, an ultra-low power, high-speed dual RS232 transceiver. It supports data [RX, TX] channels as well as flow control [RTS, CTS] channels that can easily be assigned to 1 of 10 GPIO pins. This device features a shutdown mode that reduces supply current as low as 0.5 µA. This can be done manually or by setting the TRS3122E into its *Auto-Powerdown Plus* mode.

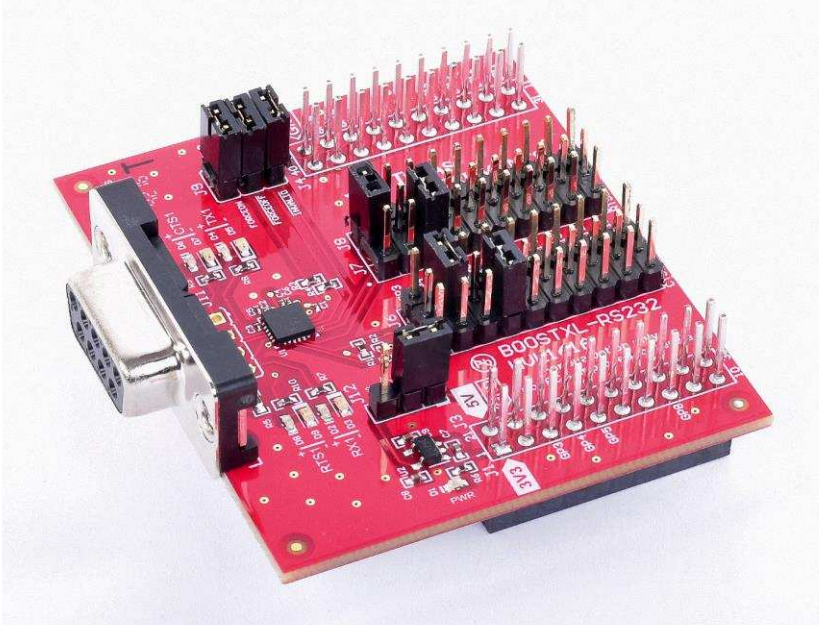


Figure 1. BOOSTXL-RS232

1 BoosterPack Features

- 1× TRS3122E RS-232 Dual Transceiver
- 1× LP2985-18 LDO Regulator
- Power indication LED
- 1 set of transmit and receive indication LEDs for each line
- On board linear regulator for 1.8-V or 3.3-V supply option
- Supports data rates up to 1 Mbps
- Auto-Powerdown Plus
- Invalid interrupt signal

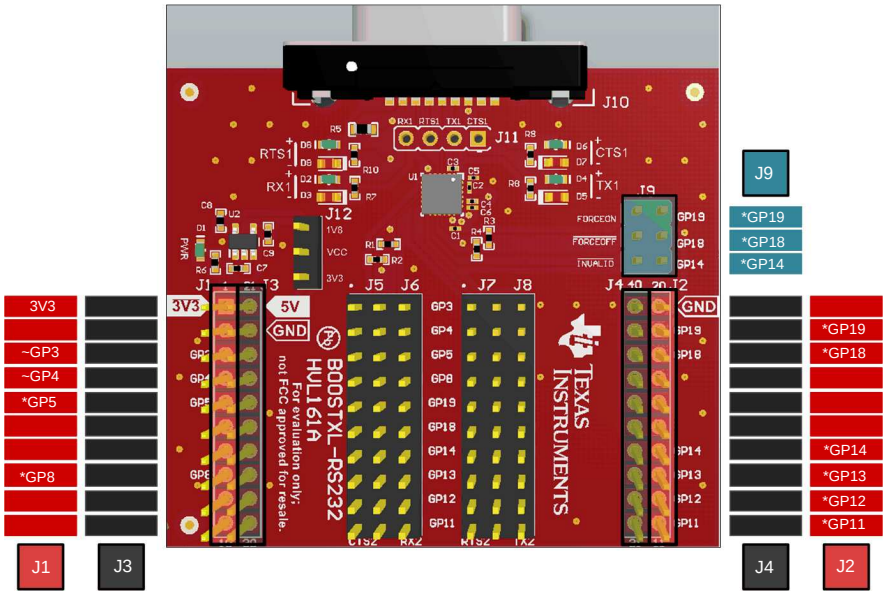
2 BoosterPack Pinout

TI BoosterPacks are designed in a way that allows multiple devices (BoosterPacks and LaunchPads) to continually stack on top of each other.

CAUTION

When stacking devices it is important to correctly align the two devices and to make sure that any unwanted connections are not made by accident. This can occur when header pins on the below device contacts vias and/or through-hole solder joints of the above device. This can cause shorts that may cause the incorrect operation of circuits and potential damage to hardware.

Figure 2 shows the top layer of the BOOSTXL-RS232 with the headers J1-4 and J9 highlighted. J1-4 are eventually connected directly to LaunchPad pins. J9 is highlighted because the right column is routed directly to header pins that are connected to LaunchPad pins. The highlighted headers are color-matched to the description boxes on the exterior of the image of the board. If the description boxes are labeled, it means that they are specifically routed on the BoosterPack. For example, the first red box on the left is labeled 3V3 and it is lined up with pin 1 of J1, which is highlighted red. This means that pin 1 of J1 is connected to the 3V3 pin of the LaunchPad. If they are empty, they are not routed. Notice that the inner, black headers are not routed at all. This is because they are not needed for the operation of this board and are left available to stack other development boards that might need them. See ti.com/launchpad for details regarding connecting to other development boards.



(1) Pins with no name or description are not connected. Pins with the same name and description are shorted together.

(2) * these pins are not required for BoosterPack operation

(3) ~ these pins are not required to be used but are recommended

Figure 2. Interfacing With LaunchPad

3 Getting Started With Your BoosterPack

3.1 Initial Jumper Settings

The BOOSTXL-RS232 comes with shunt jumpers in a default set up. This section describes the default set up and explains how to change them.

3.1.1 J5/J6 and J7/J8 GPIO Headers

The J5/6 and J7/8 10 × 3 headers are for assigning the TRS3122E UART drivers and receivers (labeled as CTS2, RX2, RTS2, and TX2 on the BoosterPack) to various LaunchPad GPIOs. The default jumper set up has TX2, RX2, RTS2, and CTS2 assigned to LaunchPad GPIO pins GP3, GP4, GP5, and GP8, respectively. This is shown in Table 1. It is recommended to tie TX2 and RX2 to GP3 and GP4, respectively, since GP3 and GP4 are typically the UART transmit and receive ports on TI LaunchPads, this is not required but should be kept in mind. RTS2 and CTS2 can be connected to any desired GPIO pin.

Table 1. J5/J6 and J7/J8 Default

TRS3122E Driver/Receiver	BOOSTXL-RS232 Serial Label	LaunchPad GPIO
DIN1 (Driver Input 1)	TX2 (Transmit 1)	GP3
ROUT1 (Receiver Output 1)	RX2 (Receive 1)	GP4
ROUT2	RTS2 (Request to Send 2)	GP5
DIN2	CTS2 (Clear to Send2)	GP8

Each pin of the middle column of the 10 × 3 headers correlates to a particular GPIO pin. The pin it is connected to is labeled in between the J5/J6 and J7/J8 header groups. This is seen in Figure 3. The columns on either side of the middle column are connected to their coinciding transceiver pins, which are labeled at the bottom of each column. This is seen in the Figure 3. For example, looking at header J5/6 in Figure 3, the right column coincides with RX2. Placing a jumper across the second pins of the middle column and the right column would short GP4 from the LaunchPad to the DIN1 pin on the TRS3122E.

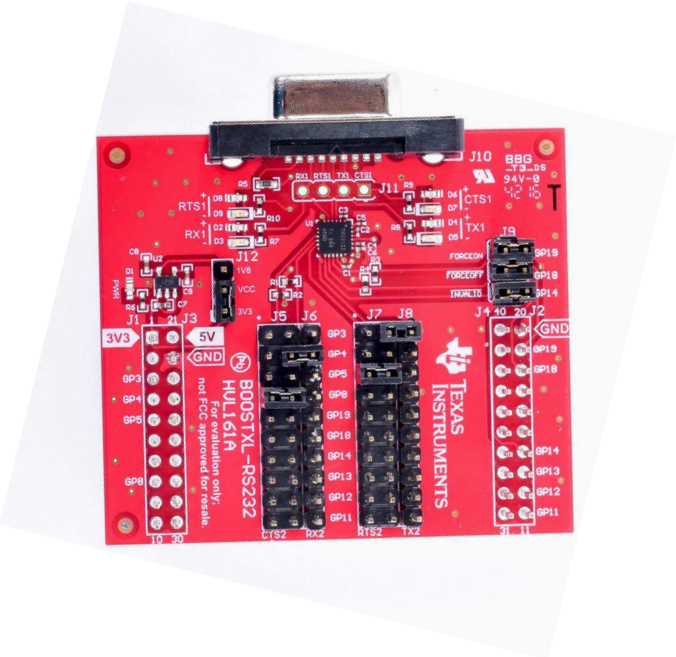


Figure 3. Topside of Board

3.1.2 J9 Header

The J9 3 × 2 header allows for the option to assign FORCEON and $\overline{\text{FORCEOFF}}$ to GP19 and GP18, respectively. FORCEON can be connected to GP19 by placing a jumper across pins 1 and 2 on J9 and $\overline{\text{FORCEOFF}}$ can be connected to GP18 by placing a jumper across pins 3 and 4 on J9, see Figure 4 for reference. This allows for the control of the different functional modes of the TRS3122E. However, these pins are also pulled-up to VCC with resistors, so if they are not intended to be used, it is recommended to remove the jumpers. This will cause the TRS3122E to be in a Forced On state. The J9 3 × 2 header also allows for the option to monitor the INVALID pin of the TRS3122E by linking it to a GPIO pin on a LaunchPad. The GPIO port on a LaunchPad can then be set to an input and used to monitor the INVALID pin. J9 is default set with three shunt jumpers as described in Table 2.

Table 2. J9 Header Default

TRS3122E Pin	LaunchPad GPIO
FORCEON	GP19
$\overline{\text{FORCEOFF}}$	GP18
$\overline{\text{INVALID}}$	GP14

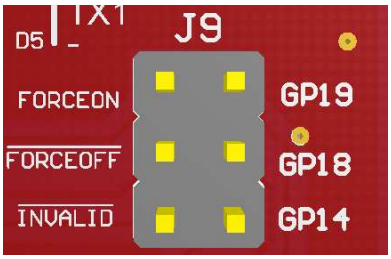


Figure 4. Header J9

3.1.3 J12 Header

The BOOSTXL-RS232 BoosterPack allows the user to switch between a 1.8-V and 3.3-V supply for communication with LaunchPads capable of 1.8-V or 3.3-V logic levels. This BoosterPack comes defaulted with VCC set to 3.3 V by shorting pin 1 and 2 together on the J12 header. Pin 1 is denoted with a white line along one edge of the pin, as seen in Figure 5. VCC should only be set to 1.8 V if the BOOSTXL-RS232 is intended to interface with a LaunchPad that operates at 1.8-V logic levels. Otherwise, it is recommended to leave the jumper across pins 1 and 2 of J12.

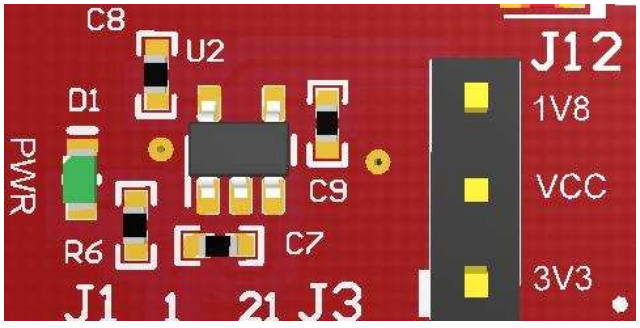


Figure 5. Supply Select

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