

# Programming Board for Programmable Hex Voltage Supervisor with EEPROM

## DESCRIPTION

The DC2293A programming board contains the circuitry needed to program and verify the EEPROM of the LTC2933. This is its sole purpose. The LTC<sup>®</sup>2933 comes in either a 16-pin SSOP or a 16-pin DFN package. The DC2293A-A supports the SSOP and the DC2293A-B supports the DFN package.

The LTpowerPlay GUI stores configuration settings into the LTC2933 EEPROM. Download and install the software from this location:

<http://www.linear.com/ltpowerplay/>

The DC2293A communicates with LTpowerPlay through a Linear Technology<sup>®</sup> DC1613 USB to I<sup>2</sup>C/SMBus/PMBus Controller.

### What Can You Do with the DC2293A

1. Compare the contents of the device's EEPROM against any Project File. (Verify)
2. Reprogram the contents of the device's EEPROM using any Project File. (Program and Verify)

### Demo System Required Hardware

- Windows PC
- USB-to-I<sup>2</sup>C/SMBus/PMBus Controller (DC1613)
- DC2293A-A or DC2293A-B  
(LTC2933 component must be ordered separately.)

### Demo System Required Software

- LTpowerPlay

### LTC2933 Features

- Supervise 6 Power Supplies
- I<sup>2</sup>C Adjustable UV and OV Trip Points
- Guaranteed Threshold Accuracy: ±1% (Maximum)
- I<sup>2</sup>C/SMBus Interface
- Internal EEPROM
- 256 Programmable Thresholds per Channel
- Up to Three Range Settings per Channel
- Two General Purpose Inputs and 3 GPIOs
- Supply Voltage Range: 3.4V to 13.9V
- Supply Voltage Power Sharing from V1 to V4
- 16-Pin 5mm x 4mm DFN and SSOP Packages

Design files for this circuit board are available at <http://www.linear.com/demo/DC2293A>

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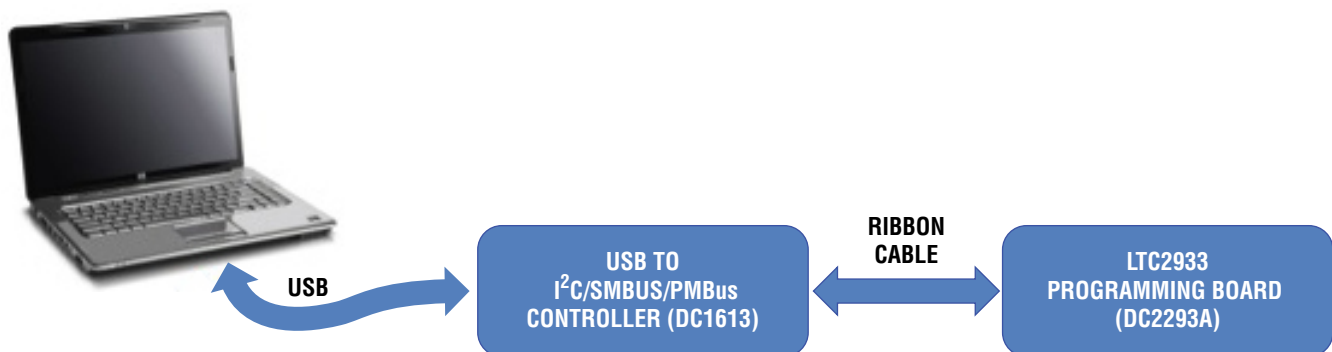


Figure 1. LTC2933 Programming Setup Using DC2293A

## BOARD PHOTO

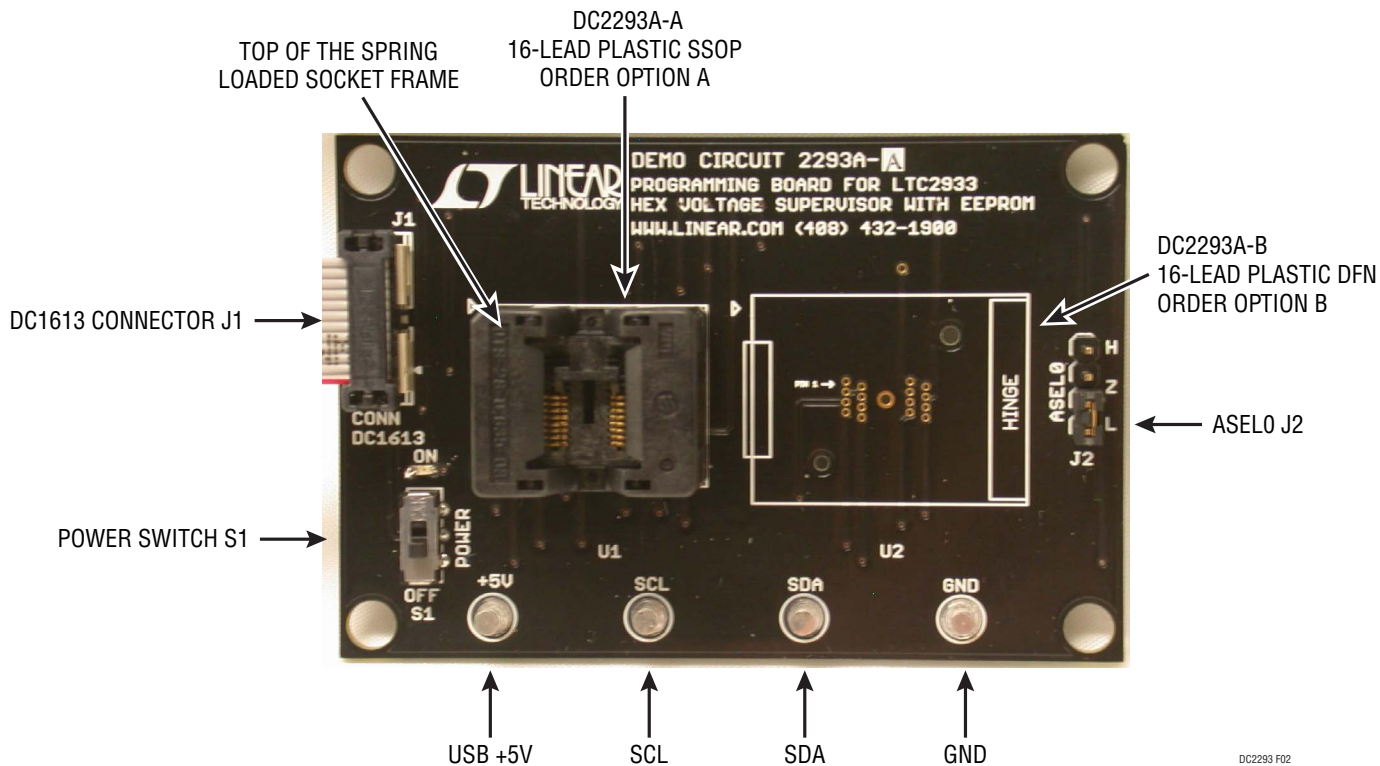


Figure 2. DC2293A Top Side Details (DC2293A-A Shown)

## ORDER INFORMATION

There are two versions of the DC2293A. Each version of the programming board comes with only one socket. See table below.

ORDER NUMBER	SUPPORTED DEVICES
DC2293A-A	LTC2933 16-Lead Plastic SSOP
DC2293A-B	LTC2933 16-Pin (5mm × 4mm) Plastic DFN

# LTpowerPlay GUI SOFTWARE

LTpowerPlay is a powerful Windows-based development environment that supports Linear Technology Power System Management ICs with EEPROM, including the LTC2933 Programmable Hex Voltage Supervisor. The software supports a variety of different tasks. You can use LTpowerPlay to evaluate Linear Technology ICs by connecting to a demo board system. LTpowerPlay features an offline mode to build a multi-chip configuration file for later use with hardware. LTpowerPlay provides unprecedented system level diagnostic and debug features. It becomes a valuable diagnostic tool during board bring-up to program or tweak the power management scheme in a system or

to diagnose power issues when bringing up rails. LTpowerPlay utilizes the DC1613 I2C/SMBus/PMBus Controller to communicate with one of many potential targets, including the DC2293A demo system or a customer board. The software also provides an automatic update feature to keep the software current with the latest set of device drivers and documentation. Download the software from:

<http://www.linear.com/ltpowerplay>

Select “Help, View Online Help” from the LTpowerPlay menu to access technical documents.

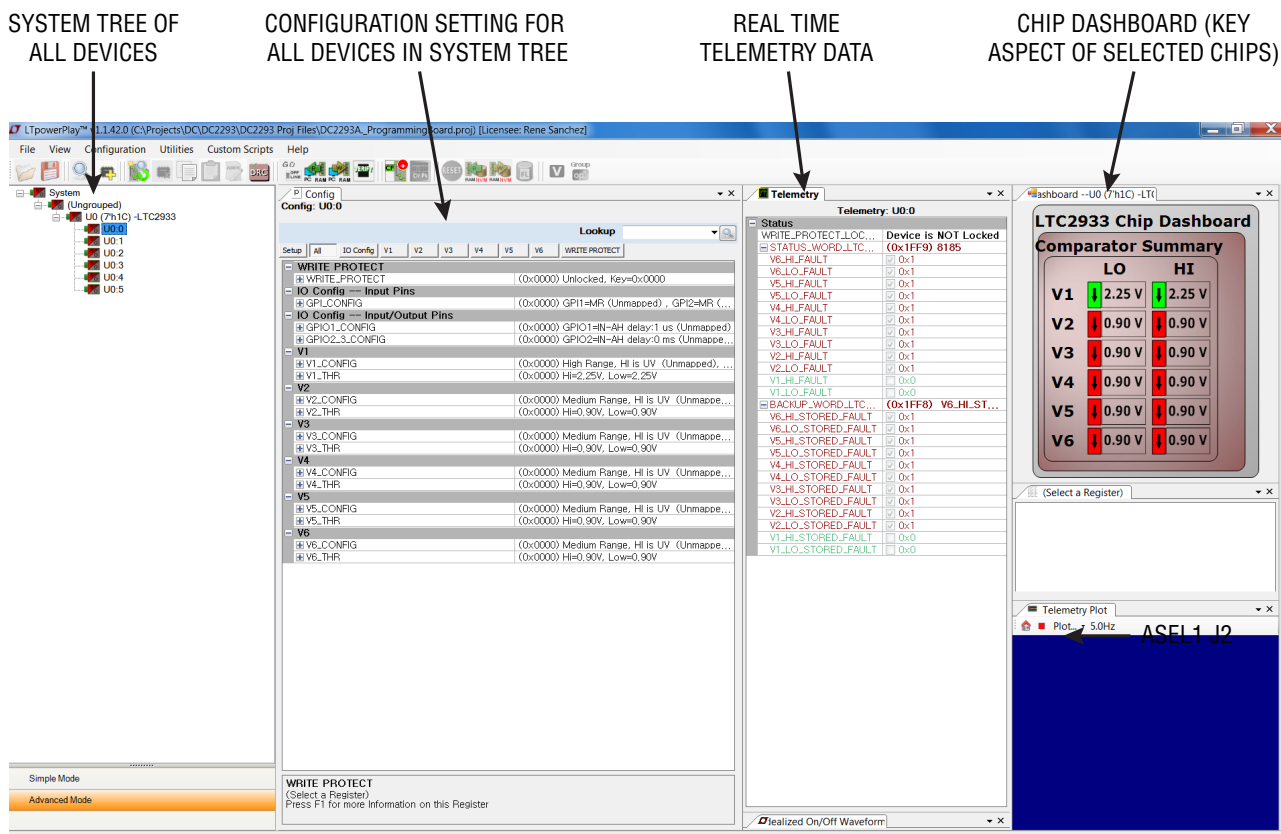


Figure 3. Screenshot of the LTpowerPlay GUI

## QUICK START PROCEDURE

The DC2293A programming board makes it easy to program and verify the LTC2933 EEPROM contents.

1. Place jumpers and switches in the following default positions:

ASELO: L  
S1: OFF

NOTE: By default, the ASELO jumper is set to low. If you wish to program a device with an address other than 0x1C, adjust the ASELO jumper appropriately. Consult device data sheet for details.

2. Connect the DC1613 USB controller to your PC. Plug the ribbon cable into connector J1 of the DC2293A programming board. See Figure 4.

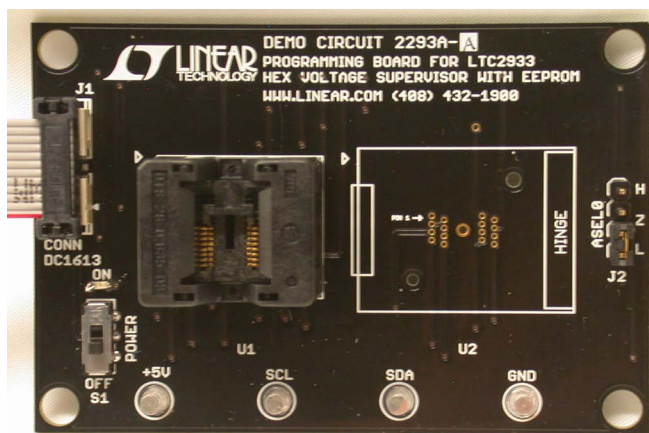


Figure 4. DC2293A-A with Open Socket

NOTE: Removal and insertion of the IC should be done with either tweezers or a vacuum device, and also with the power switch S1 set to OFF.

3. If using DC2293A-A, open the pinch contacts of the socket by pressing down and holding the top of the spring loaded socket frame. Place the IC inside the socket with pin 1 located in the upper left corner. Slowly release the top of socket frame, allowing contacts to pinch together and grip IC leads. See Figure 5.

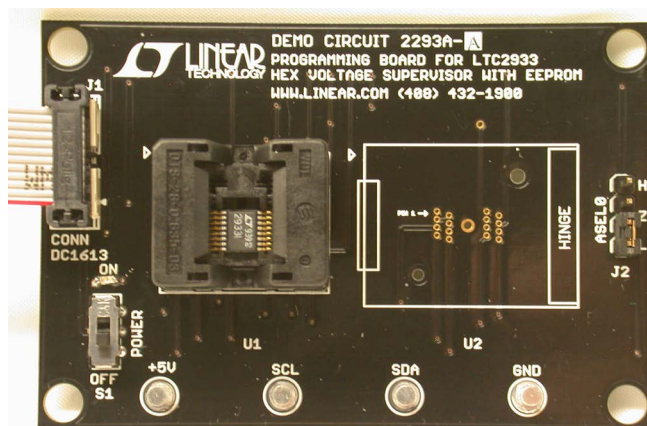


Figure 5. DC2293A-A and IC Installed

## QUICK START PROCEDURE

4. If using DC2293A-B, flip open the socket lid and place the IC inside with pin 1 located in the upper left corner. See Figure 6.

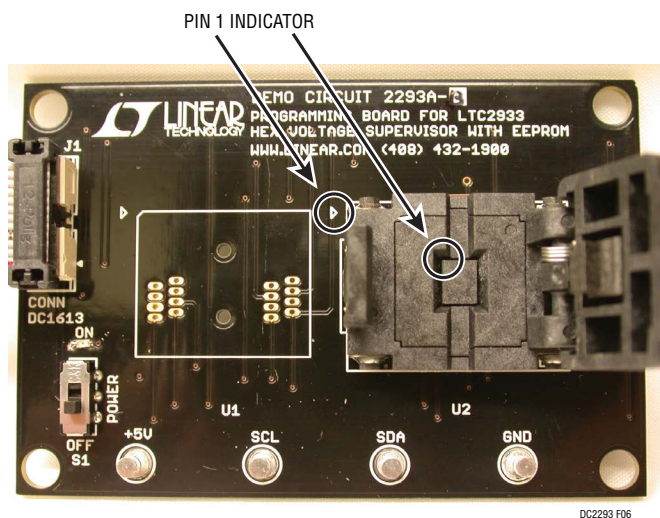


Figure 6. DC2293A-B and IC Installed

Close the lid. It will snap into place. See Figure 7.

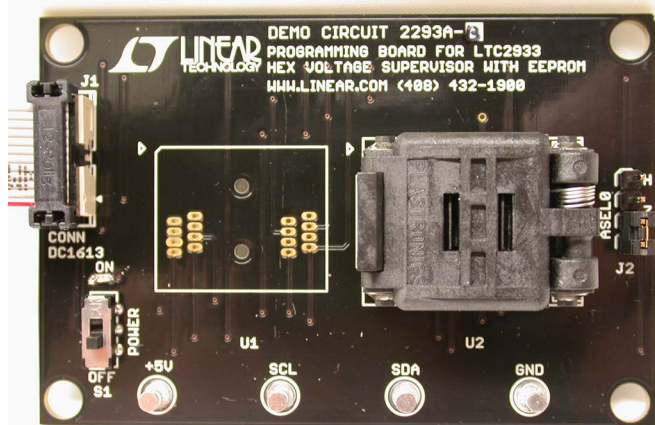


Figure 7. DC2293A-B and IC Installed

- Set the power switch S1 to the ON position. The VDD33 LED will illuminate, indicating the on-chip regulator is providing internal power. If the LED does not illuminate, check the orientation of the IC in the socket. Pin 1 must be in the upper left corner.
- Launch the LTpowerPlay software from your PC. The device programming utility shown in Figure 8 should pop up automatically. If it does not, then select the Utilities>Programming Utility from the menu shown in Figure 9.
- Click “...” next to the selection box and select a .proj file from your system to program the device. See Figure 8.

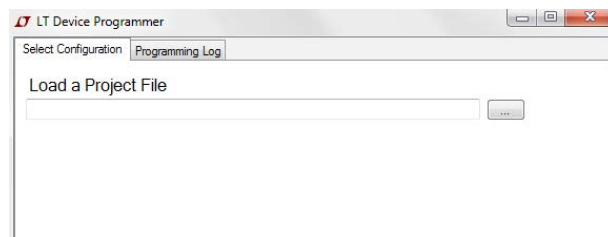


Figure 8. Selecting a .proj File to Program

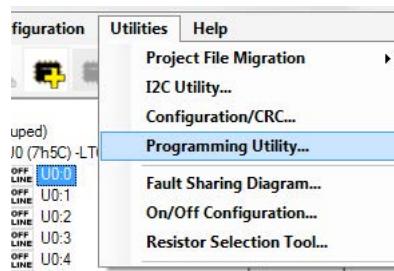


Figure 9. Utilities > Programming Utility from the Menu

## QUICK START PROCEDURE

- Click the “Program and Verify” button (See Figure 10) and wait for the process to complete. After the process is complete, you will see “Successfully Programmed and Verified Device” in the status bar at the bottom. See Figure 11.

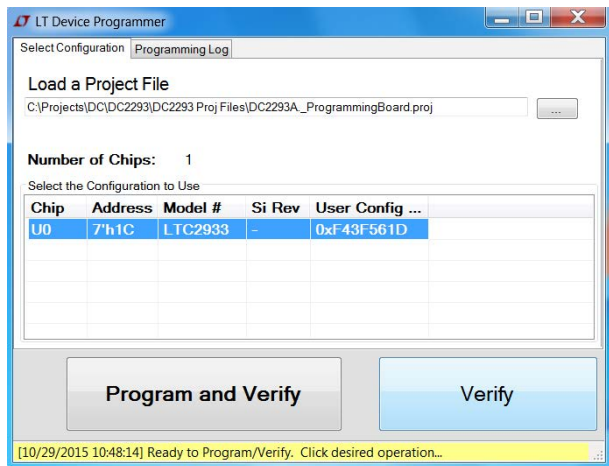


Figure 10. Device Programming Utility.

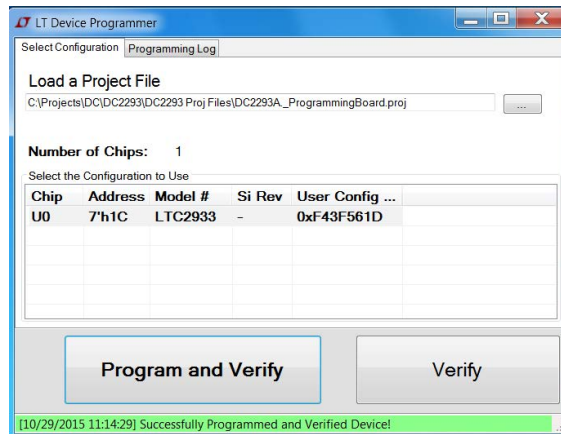
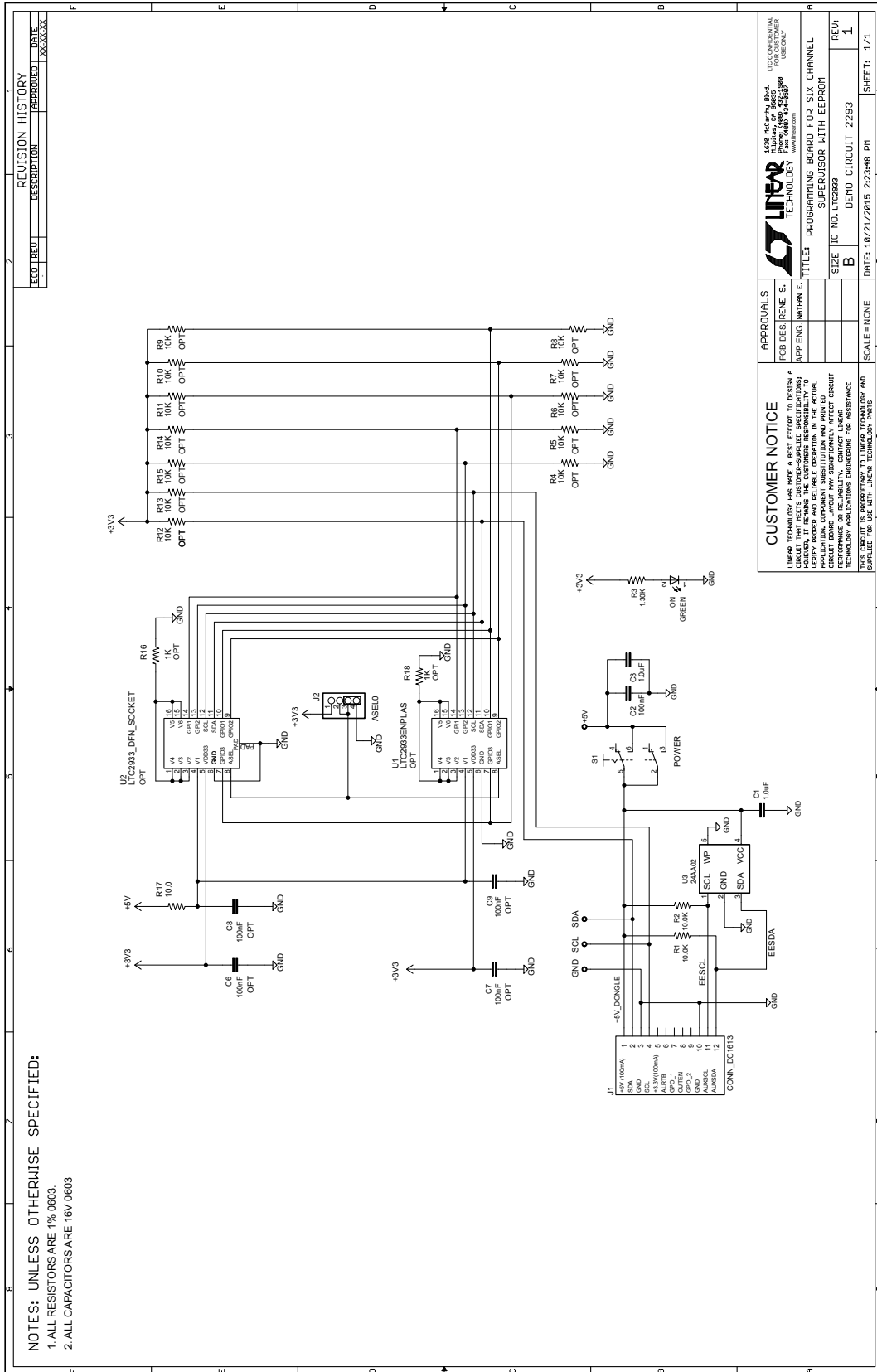


Figure 11. Programmed and Verified Device

- Set the power switch S1 to the OFF position prior to removing the device.

Repeat steps above to program additional devices. LTpowerPlay’s Programming Utility does not need to be closed. The ribbon cable may remain connected to the programming board.

## SCHEMATIC DIAGRAM



# DEMO MANUAL DC2293A

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**Please read the DEMO BOARD manual prior to handling the product.** Persons handling this product must have electronics training and observe good laboratory practice standards. **Common sense is encouraged.**

This notice contains important safety information about temperatures and voltages. For further safety concerns, please contact a LTC application engineer.

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