

## LTC2662 5-Channel, 16-/12-Bit, 300mA, SoftSpan Current Source DACs

### DESCRIPTION

Demonstration circuit 2692A-A features the [LTC®2662](#), 5-channel, 16-bit, 300mA, current source DACs with 10ppm/°C reference in a 5mm × 5mm QFN package. This device features per-channel SoftSpan™ configuration of 3.125mA to 300mA, a separate supply for each output, and an internal switch to allow any output pin to be connected to V<sup>-</sup>.

Pin-compatible 12-bit versions are available for lower resolution requirements on the DC2692A-B.

**Design files and Bill of Materials for this circuit board are available at <http://www.linear.com/demo/DC2692A>**

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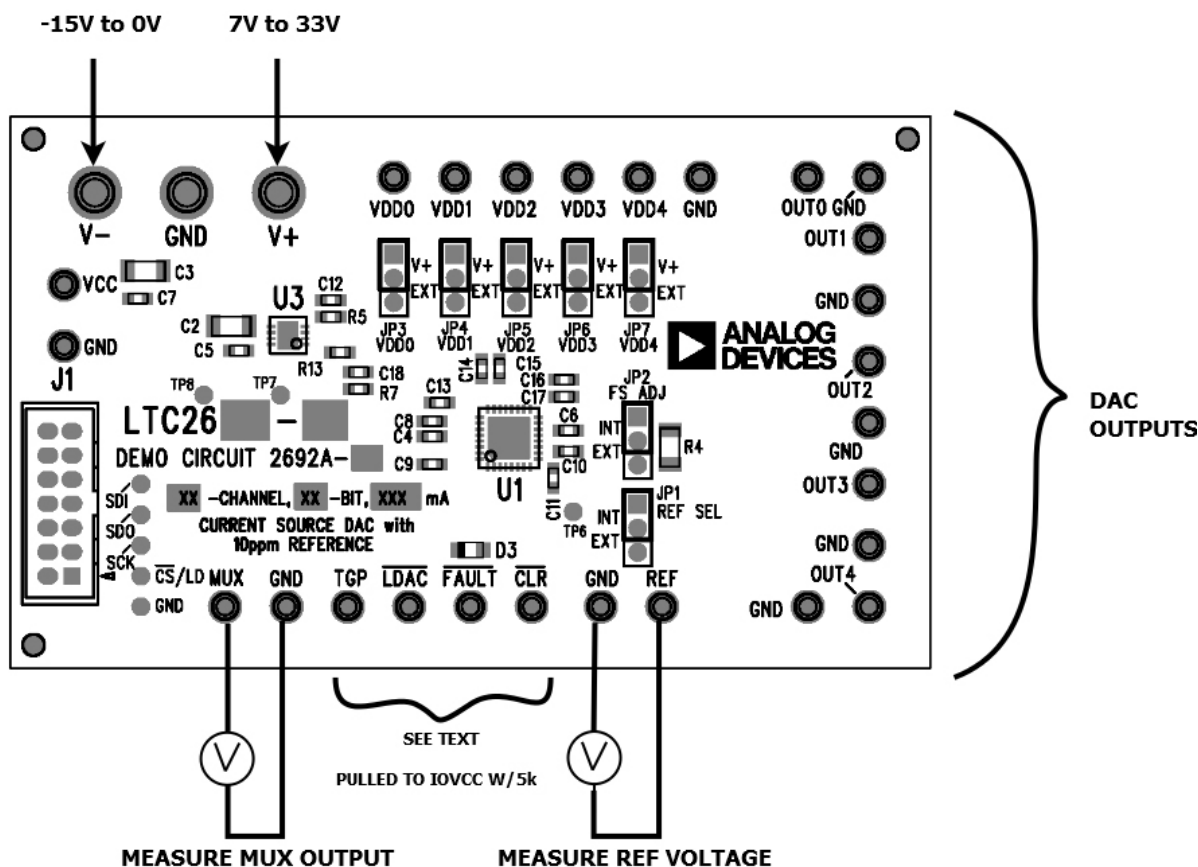


Figure 1. Connection Diagram

## ASSEMBLY OPTIONS

ASSEMBLY TYPE	PART NUMBER	DAC CHANNELS	BITS	MAX CURRENT PER CHANNEL
DC2692A-A	LTC2662-16	5	16	300mA
DC2692A-B	LTC2662-12	5	12	300mA

## QUICK START PROCEDURE

1. Download and install QuikEval™ from:  
<http://www.linear.com/quikeval>
2. Connect a DC590 controller or DC2026 Linduino® with the DC590 emulator firmware to the DC2692A with the supplied ribbon cable.
3. Connect low noise analog power supplies as shown in Figure 1. Refer to the data sheet for other supply options.
4. Connect the controller to the host PC's USB port and run QuikEval. The DC2692A software will be downloaded and installed, after which the GUI will appear

as shown in Figure 2. The control panel gives access to all of the LTC2662's functionality including per-channel SoftSpan ranges, toggling, power-down, etc. Detailed instructions are provided in the Help menu.

### Using External Reference for the DC2692

To use an external reference to drive the DC2692, move the jumper named REF SEL (JP1) from the INT position to the EXT position. Use the REF turret to drive the reference voltage. If this is done after the DC2692 was powered up, then the internal reference will need to be disabled from the control register.

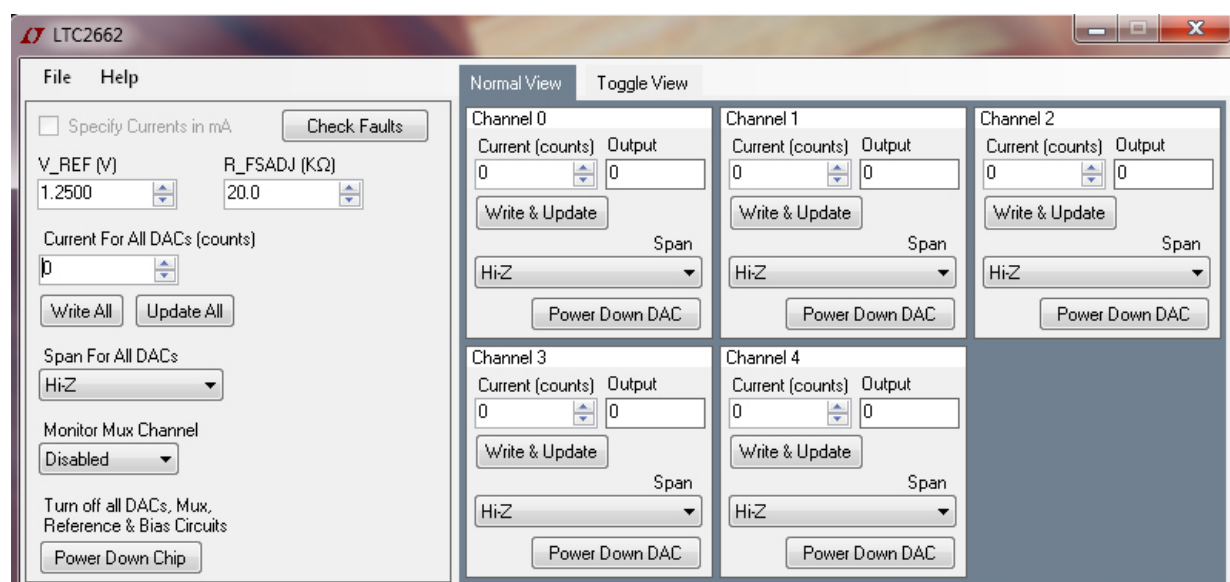


Figure 2. Main Control Panel

## QUICK START PROCEDURE

### Using External Precision Resistor to Adjust Full-Scale Output Current

The DC2692 has an unstuffed resistor (R4) that can be used to set and adjust the full-scale output current. Move the jumper named FS ADJ (JP2) from INT to EXT. It is recommended to use a resistor with better than 2ppm/°C temperature coefficient to take advantage of the LTC2662 low temperature coefficient. Values between 19k and 50k can be used for the precision resistor.

### Using External Supplies for V<sub>DDx</sub>

The DC2692 can be configured to connect different supplies than V<sup>+</sup>. Move the jumper labeled V<sub>DDx</sub> from V<sup>+</sup> to EXT and connect the low noise supply to the corresponding V<sub>DDx</sub> turret.

### Connectors and Turrets

**J1:** Interface connector to DC590 controller or Lin-duino provides IOVCC power, SPI interface, and board identification.

**V<sup>-</sup>, GND, V<sup>+</sup>:** Analog supplies, connected to the LTC2662 V<sup>+</sup> and V<sup>-</sup> pins. Nominally positive supply should be 7V to 33V and negative supply should be 0V to -15V. Refer to the data sheet for other supply configurations.

**GND:** Additional ground posts and exposed ground plane around the board edge allow solid connection to prototype circuitry and measurement equipment.

**V<sub>CC</sub>:** Analog supply voltage. Normally supplied by an onboard LT3042 regulator set to 5V that is powered from the V<sup>+</sup> supply. For single supply applications, V<sub>CC</sub> may be tied directly to V<sup>+</sup> and supplied with 2.85V to 5.5V.

**V<sub>DD0</sub> to V<sub>DD4</sub>:** Output supply voltage. A jumper is used to connect the output supply to V<sup>+</sup>. Placing the jumper in the EXT position allows the output supply voltage channel to be connected externally to this point.

**REF:** Connection to the REF pin. In internal reference mode, the reference voltage may be monitored at this point. Placing REF SEL jumper in EXT position allows an external low noise reference to be connected to this point. Refer to the data sheet for compatible voltages.

**MUX:** Monitor Mux output. Allows surveying the DAC outputs under software control. Must be measured with a high impedance meter (output impedance is nominally 10kΩ).

**OUT0 – OUT4:** DAC outputs.

**CLR:** Asynchronous clear input (pulled high to IOVCC with a 5k resistor). Pull to the ground to reset the DAC to the power-on reset value.

**TGP:** Toggle input (pulled high to IOVCC with a 5k resistor). A high level on this pin enables software toggling. See data sheet for a complete description of toggle operation.

**LDAC:** Asynchronous DAC update. If  $\overline{\text{CS/LD}}$  is high at the falling edge of  $\overline{\text{LDAC}}$ , DAC outputs will be updated with the contents of the input registers. If  $\overline{\text{CS/LD}}$  is low when  $\overline{\text{LDAC}}$  goes low, the DAC registers are updated after  $\overline{\text{CS/LD}}$  returns high.

**FAULT:** Fault detection pin (pulled high to IOVCC with a 5k resistor). The LTC2662 pulls this pin low if a fault is detected. It is released on the next rising edge of  $\overline{\text{CS/LD}}$ .

### Jumpers

**REF SEL (JP1):** Selects internal or external reference mode.

**FS ADJ (JP2):** Sets the full-scale current for the DACs. Ensure FS ADJ is set to EXT position when using an external precision resistor.

**V<sub>DD0</sub>, V<sub>DD1</sub>, V<sub>DD2</sub>, V<sub>DD3</sub>, V<sub>DD4</sub> (J3, J4, J5, J6, J7):** Select the output supply voltages for the DACs to be either V<sup>+</sup> or external via the turret.

### LEDs

**FAULT:** Lights when  $\overline{\text{FAULT}}$  pin asserts, indicating a fault has occurred. (Note that LED will light if positive analog supply is present and IOVCC is not. IOVCC is normally supplied by the controller.)

### Test Points

The SPI bus is available on a row of through-hole test points next to J1 that may be used to monitor the bus or drive the bus with an external controller.

**EEGND, WP:** For factory use only.

# DEMO MANUAL DC2692A

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

Mailing Address:

Linear Technology  
1630 McCarthy Blvd.  
Milpitas, CA 95035

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