

# LTC2655: Quad I<sup>2</sup>C 16-/12-Bit Rail-to-Rail DACs with 10ppm/°C Max Reference

## DESCRIPTION

Demonstration circuit 1703A features the LTC<sup>®</sup>2655 quad 16-/12-bit DAC. The LTC2655 is a family of 16-/12-bit rail-to-rail DACs with integrated 10ppm/°C maximum reference. The LTC2655 advances performance standards for output drive, crosstalk and load regulation in single supply, voltage-output multiple DACs.

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

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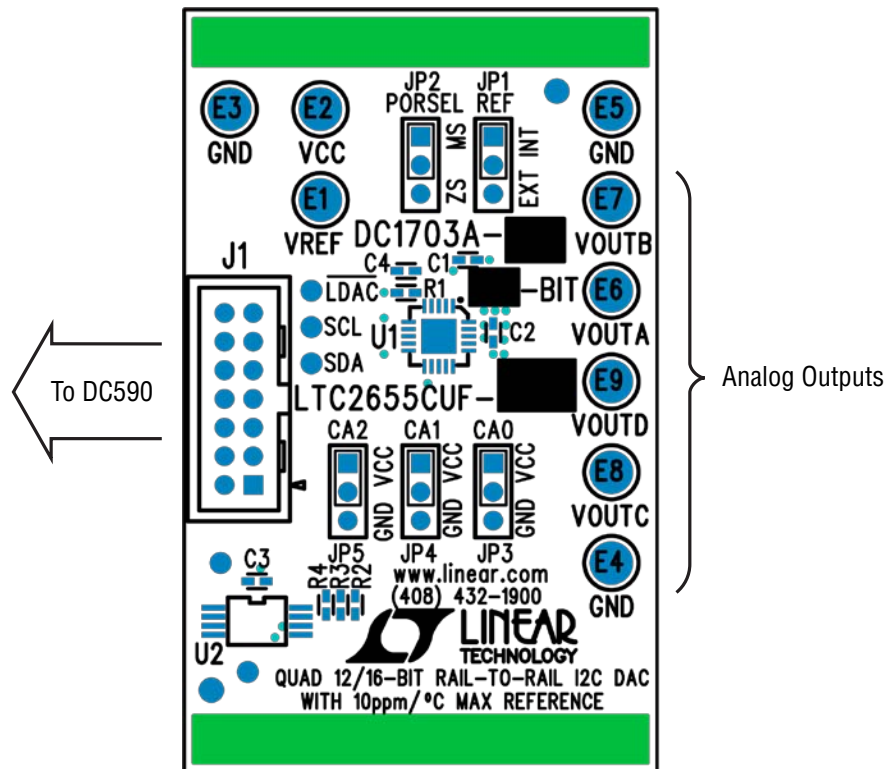


Figure 1. Connection Diagram

Table 1. LTC2655 Demo Board Variations

| DEMO BOARD TYPE | LTC2655 VARIATION | FULL-SCALE VOLTAGE |
|-----------------|-------------------|--------------------|
| DC1703A-A       | LTC2655CUF-L16    | 2.5V               |
| DC1703A-B       | LTC2655CUF-H16    | 4.096V             |
| DC1703A-C       | LTC2655CUF-L12    | 2.5V               |
| DC1703A-D       | LTC2655CUF-H12    | 4.096V             |

## QUICK START PROCEDURE

Connect the DC1703A to a DC590 USB serial controller using the supplied 14 conductor ribbon cable. Connect the DC590 to a host PC with a standard USB A/B cable. Run the QuikEval™ evaluation software supplied with the

DC590 or download it from [www.linear.com](http://www.linear.com). The correct control panel will be loaded automatically. In order to update the DAC output value, fill in desired output code inside the corresponding DAC box.

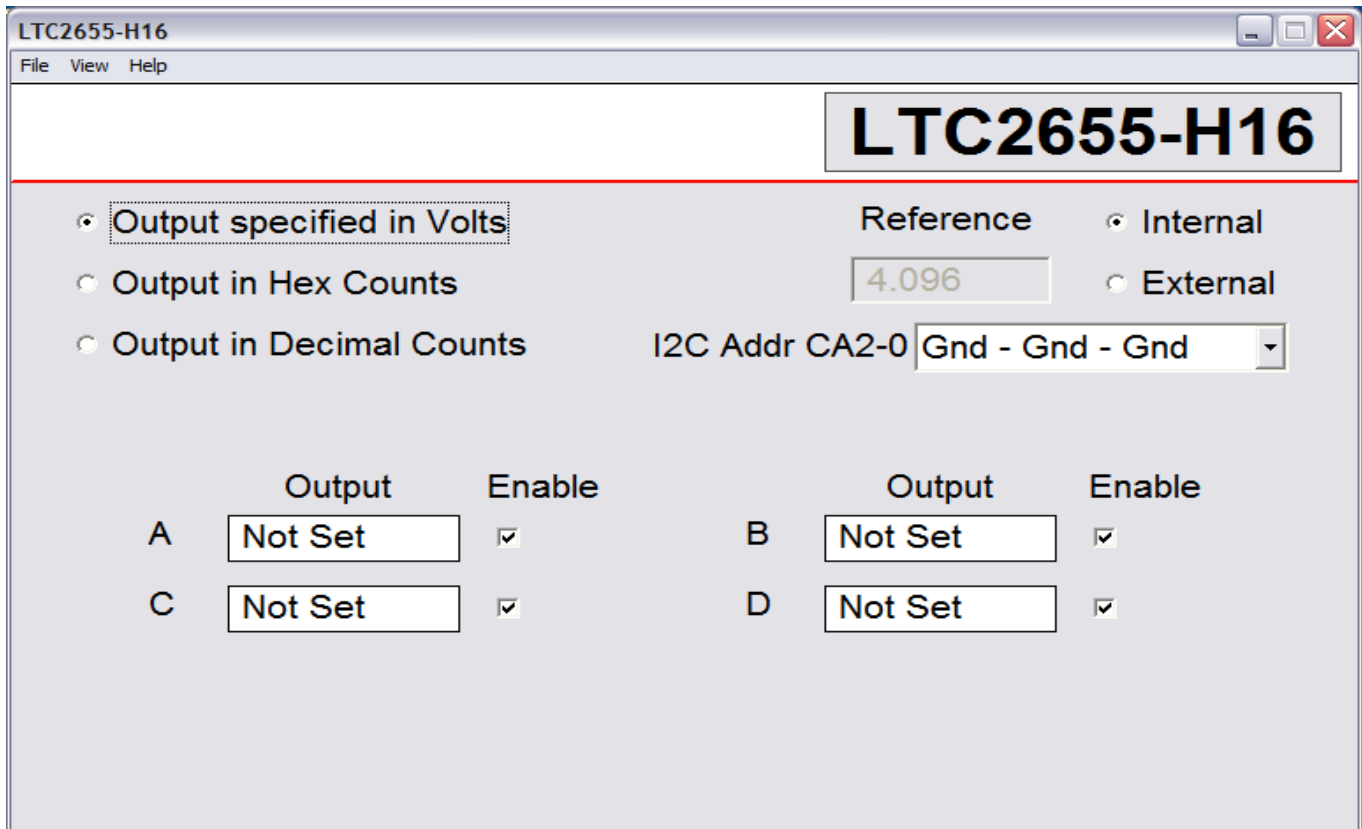


Figure 2. Demo Board Setup

## HARDWARE SET-UP

### Jumpers

**REF:**  $V_{REF}$  Select. This jumper selects which mode the LTC2655 powers up in: external reference (EXT) or internal reference (INT).

**PORSEL:** Power-Up Mode. The LTC2655 can be set to either power-up in mid-scale or zero-scale.

**CA2, CA1, CA0:** Address Selection Jumpers. These jumpers are used to select the I<sup>2</sup>C address of the DAC. Any changes here should also be made in the QuikEval software.

### Analog Connections

**DAC Outputs:** The 4 DAC outputs from the LTC2655 are brought out to turrets labeled  $V_{OUTA}$  through  $V_{OUTD}$ . These may be connected to external instruments or other circuitry.

**NOTE:** DAC outputs are not in alphabetical order on the circuit board.

**$V_{REF}$ :** The  $V_{REF}$  turret is connected directly to the reference terminals of the LTC2655. The on-chip reference may be turned off, allowing the DAC reference pin to be driven from this turret. Alternatively, when the on-chip reference is on and active, the voltage can be monitored at this turret.

**$V^+$ :** Unregulated 10V is present here when a DC590 is connected. This turret is provided for monitoring purposes only and should not be connected to any other turrets on the board.

### Grounding and Power Connections

**Power ( $V_{CC}$ ):** Normally the DC1703A is powered by the DC590 controller.  $V_{CC}$  can be supplied to this turret, however the power supply on DC590 must be disabled. Refer to DC590 Quick Start Guide for more details on this mode of operation.

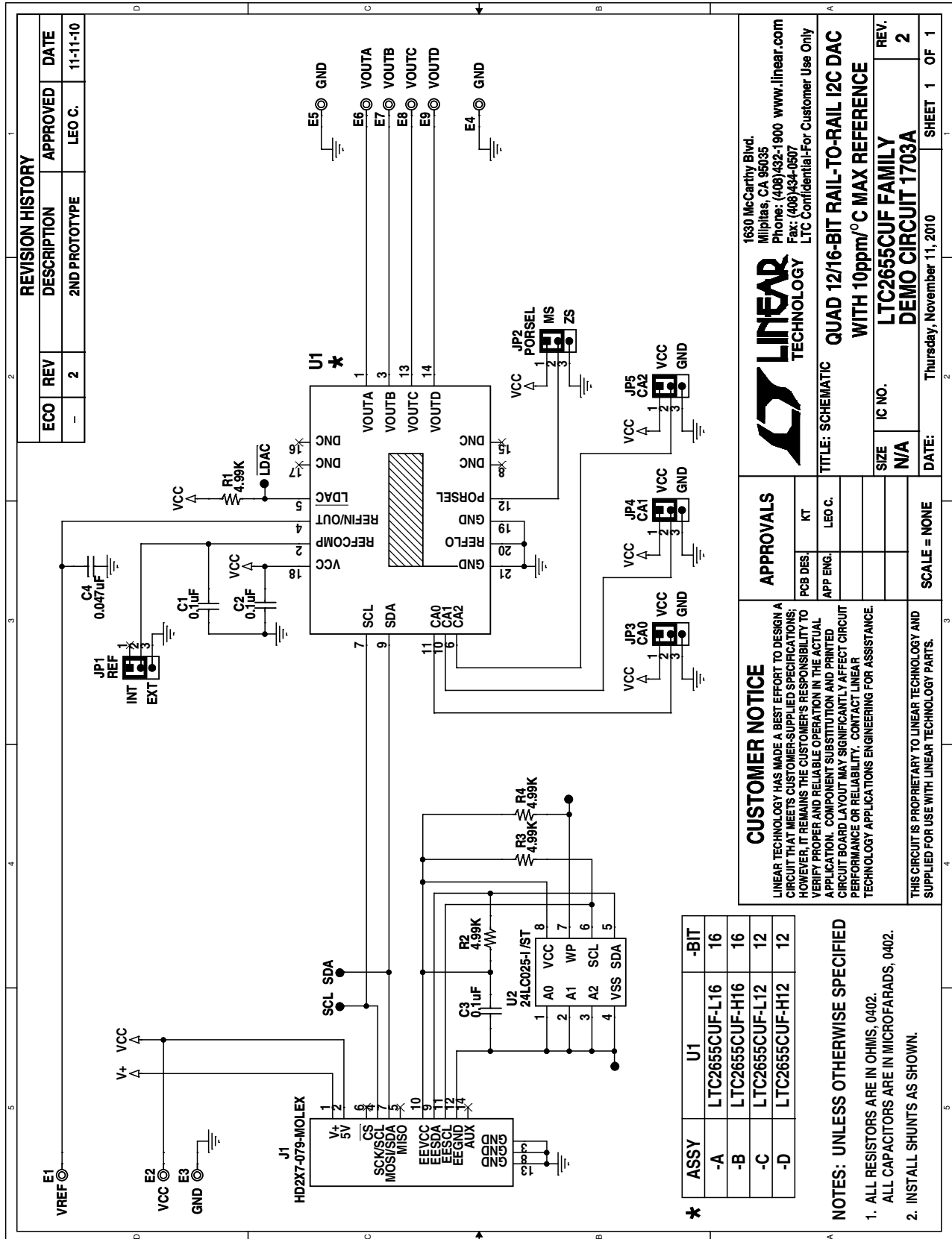
**Grounding:** There are 3 ground turrets provided (labeled GND), as well as ground strips on the top and the bottom of the board.

# DEMO MANUAL DC1703A

## PARTS LIST

| ITEM | QTY | REFERENCE                           | PART DESCRIPTION                             | MANUFACTURER, PART NUMBER         |
|------|-----|-------------------------------------|--|-----------------------------------|
| 1    | 3   | C1, C2, C3                          | Capacitor, X7R, 0.1 $\mu$ F 16V, 0402        | TDK, C1005X7R1C104K               |
| 2    | 1   | C4                                  | Capacitor, X7R, 0.047 $\mu$ F 16V, 0402      | TDK, C1005X7R1C473K               |
| 3    | 10  | E1-E10                              | TP, Turret, 0.064"                           | Mill-Max, 2308-2-00-80-00-00-07-0 |
| 4    | 5   | JP1-JP5                             | Jumper, 3-Pin 1 Row 0.079CC                  | Samtec, TMM-103-02-L-S            |
| 5    | 1   | J1                                  | Header, 2 $\times$ 7 Pin, 0.079CC            | Molex, 87831-1420                 |
| 6    | 4   | R1, R2, R3, R4                      | Resistor, Chip 4.99K 1/16W 1%,0402           | NIC, NRC04F4991TRF                |
| 7    | 1   | U2                                  | IC, Serial EEPROM, TSSOP8                    | Microchip, 24LC025-I /ST          |
| 8    | 5   | Shunts as Shown on Assembly Drawing | Shunt, 0.079" Center                         | Samtec, 2SN-BK-G                  |
| 9    | 1   | Stencil Top Side Only               |  | Stencil, 1703A                    |
| U1-A |     |                                     | IC, LTC2655CUF-L16, 4mm $\times$ 4mm QFN20UF | Linear Technology, LTC2655CUF-L16 |
| U1-B |     |                                     | IC, LTC2655CUF-H16, 4mm $\times$ 4mm QFN20UF | Linear Technology, LTC2655CUF-H16 |
| U1-C |     |                                     | IC, LTC2655CUF-L12, 4mm $\times$ 4mm QFN20UF | Linear Technology, LTC2655CUF-L12 |
| U1-D |     |                                     | IC, LTC2655CUF-H12, 4mm $\times$ 4mm QFN20UF | Linear Technology, LTC2655CUF-H12 |

**SCHEMATIC DIAGRAM**



# DEMO MANUAL DC1703A

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