

LTC2655: Quad I²C 16-/12-Bit Rail-to-Rail DACs with 10ppm/°C Max Reference

DESCRIPTION

Demonstration circuit 1703A features the LTC[®]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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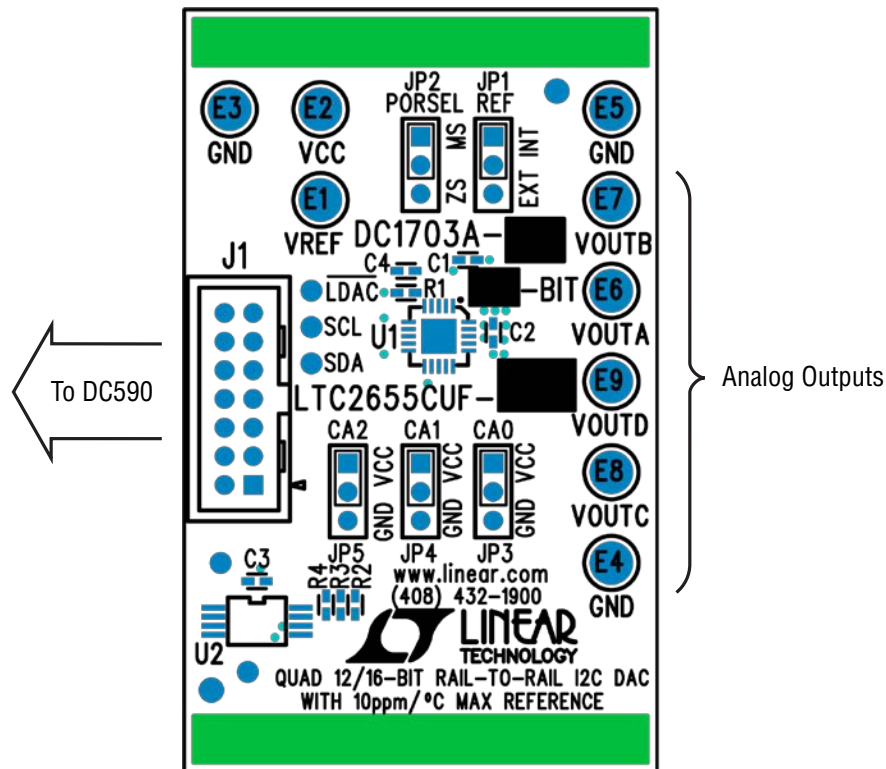


Figure 1. Connection Diagram

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. 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.

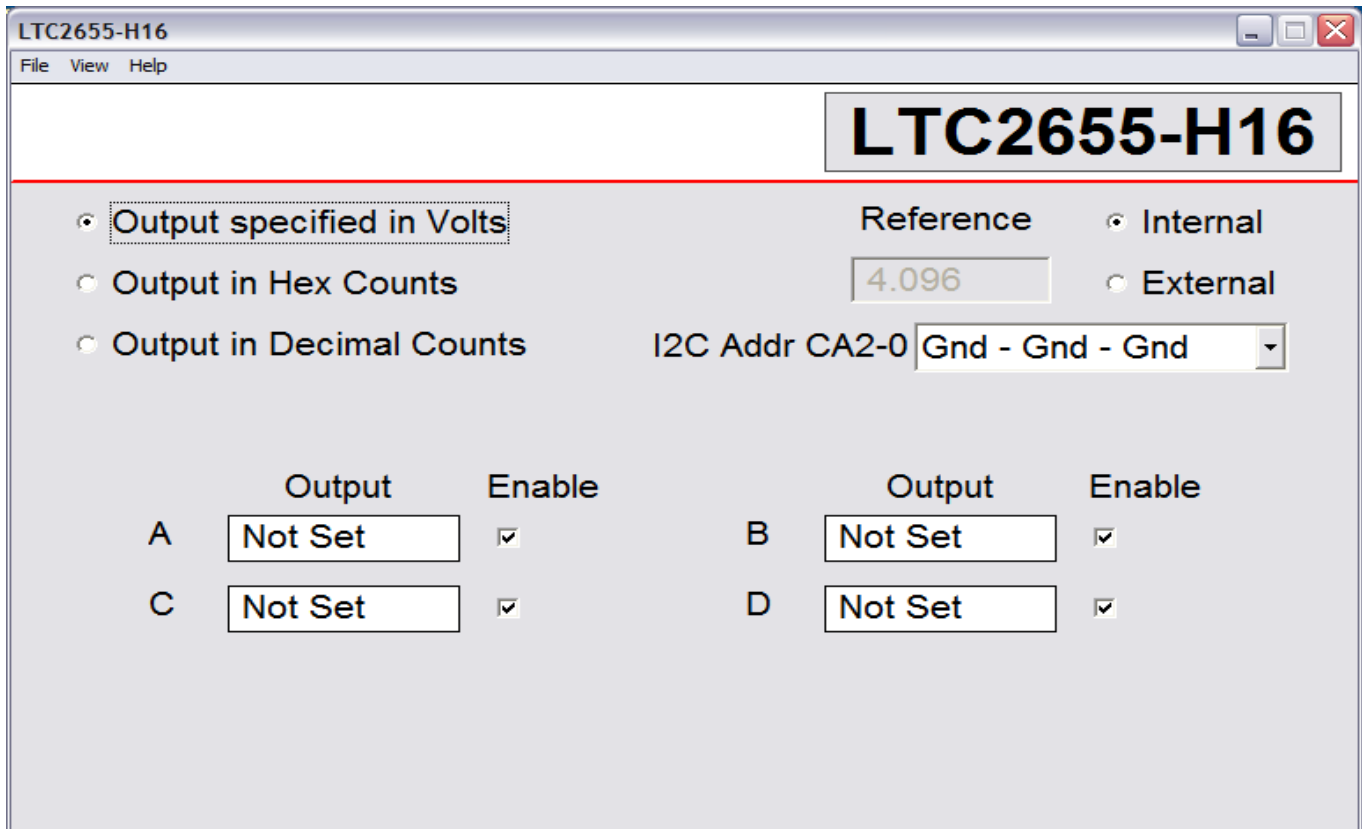


Figure 2. Demo Board Setup

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 I²C 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.

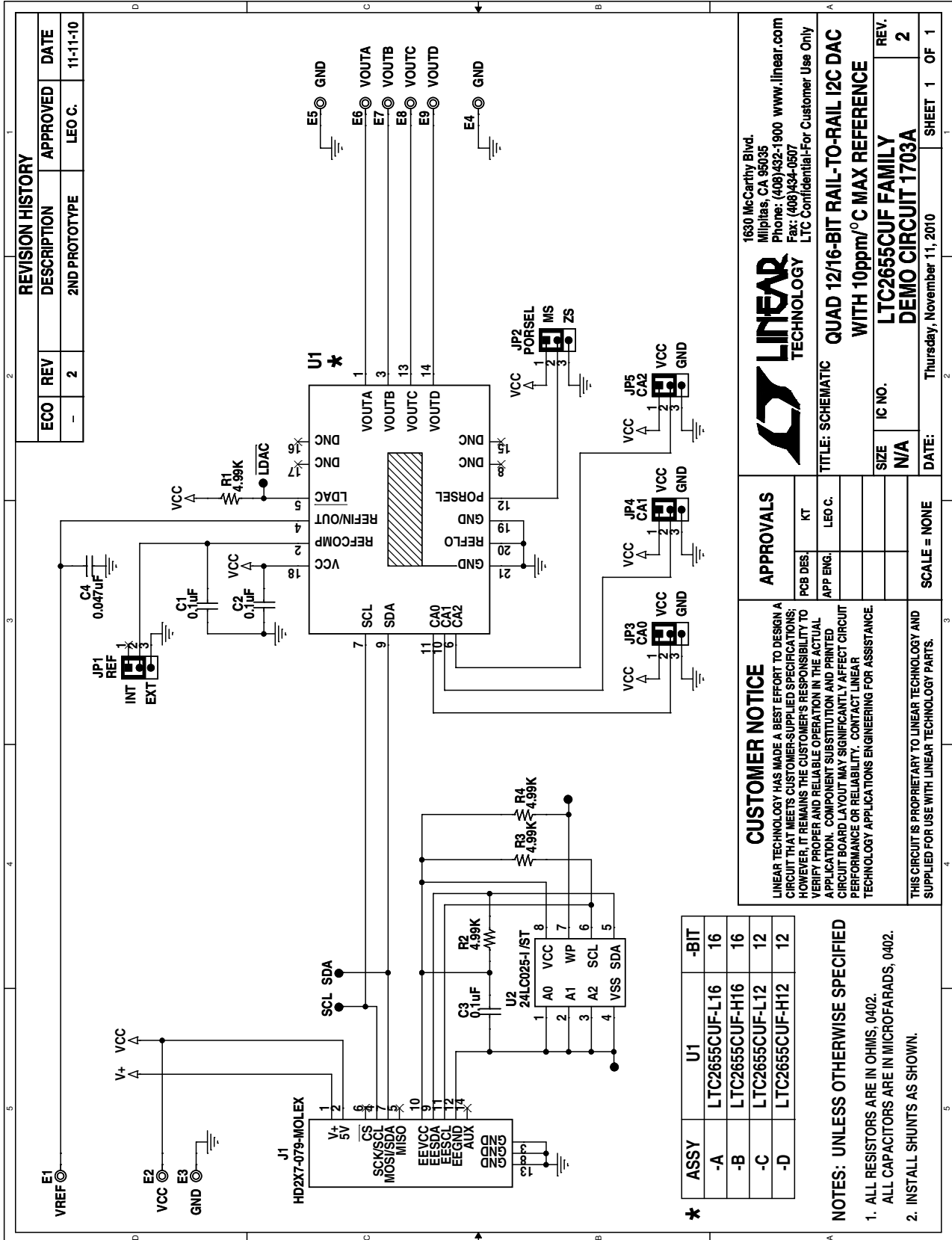
Grounding: There are 3 ground turrets provided (labeled GND), as well as ground strips on the top and the bottom of the board.

DEMO MANUAL DC1703A

PARTS LIST

ITEM	QTY	REFERENCE	PART DESCRIPTION	MANUFACTURER, PART NUMBER
1	3	C1, C2, C3	Capacitor, X7R, 0.1 μ F 16V, 0402	TDK, C1005X7R1C104K
2	1	C4	Capacitor, X7R, 0.047 μ 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



REVISION HISTORY				
ECO	REV	DESCRIPTION	APPROVED	DATE
-	2	2ND PROTOTYPE	LEO C.	11-11-10

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QUAD 12/16-BIT RAIL-TO-RAIL I2C DAC WITH 10ppm/°C MAX REFERENCE

LTC2655CUF FAMILY DEMO CIRCUIT 1703A

REV. 2

DATE: Thursday, November 11, 2010

SHEET 1 OF 1

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APPROVALS

PCB DES.	KT
APP ENG.	LEO C.

SCALE = NONE

THIS CIRCUIT IS PROPRIETARY TO LINEAR TECHNOLOGY AND SUPPLIED FOR USE WITH LINEAR TECHNOLOGY PARTS.

*** ASSY U1 -BIT**

-A	LTC2655CUF-L16	16
-B	LTC2655CUF-H16	16
-C	LTC2655CUF-L12	12
-D	LTC2655CUF-H12	12

- NOTES: UNLESS OTHERWISE SPECIFIED**
- ALL RESISTORS ARE IN OHMS, 0402.
 - ALL CAPACITORS ARE IN MICROFARADS, 0402.
 - INSTALL SHUNTS AS SHOWN.

DEMO MANUAL DC1703A

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