

LTC2631

Single 12-/10-/8-Bit I²C V_{OUT} DACs with Integrated 10ppm/°C Reference

DESCRIPTION

Demonstration circuit 1332B features the [LTC[®]2631](#), a 12-bit I²C DAC with 1LSB (max) INL error. This device establishes a new benchmark for size and integration of 12-bit DACs and onboard reference.

The DC1332B may be connected directly to the target application's analog signals while using the DC590 USB serial controller board and supplied software to measure

performance. After evaluating with Linear Technology's software, the digital signals can be connected to the end application's processor/controller for development of the serial interface.

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

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DEMO BOARD VARIATIONS

DEMO BOARD TYPE	LTC2631 VARIATION	RESOLUTION (BITS)	POWER-UP	FULL-SCALE
DC1332B-A	LTC2631ACTS8-LM12	12	Mid-Scale	2.5V
DC1332B-B	LTC2631ACTS8-LZ12	12	Zero	2.5V
DC1332B-C	LTC2631ACTS8-HM12	12	Mid-Scale	4.096V
DC1332B-D	LTC2631ACTS8-HZ12	12	Zero	4.096V

BOARD PHOTO

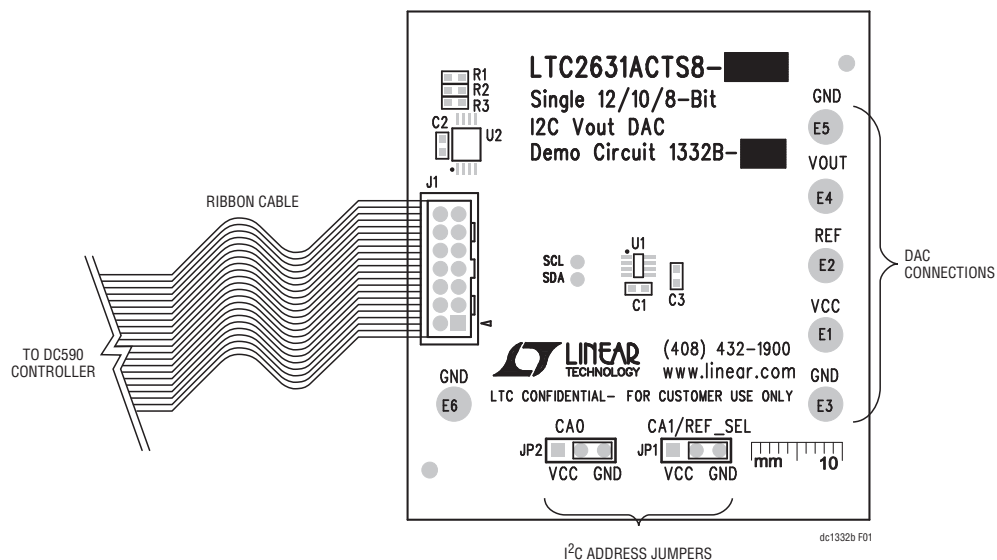


Figure 1. DC1332B Connection Diagram

QUICK START PROCEDURE

1. Connect the DC1332B to a DC590 USB serial controller using the supplied 14-conductor ribbon cable.
2. Connect the DC590 to the host PC with a standard USB A/B cable.
3. Run the QuikEval™ evaluation software supplied with the DC590 or download it from: www.linear.com/software. The correct program will be loaded automatically.

Options are available to display the DAC output in voltage, hex code, or decimal count. Additionally, the reference voltage may be changed to reflect an actual measured value, such that the output voltage matches the theoretical output voltage. The reference mode may be changed from internal reference to external reference.

Features may be periodically added to the software. See the software's help menu for the latest information.

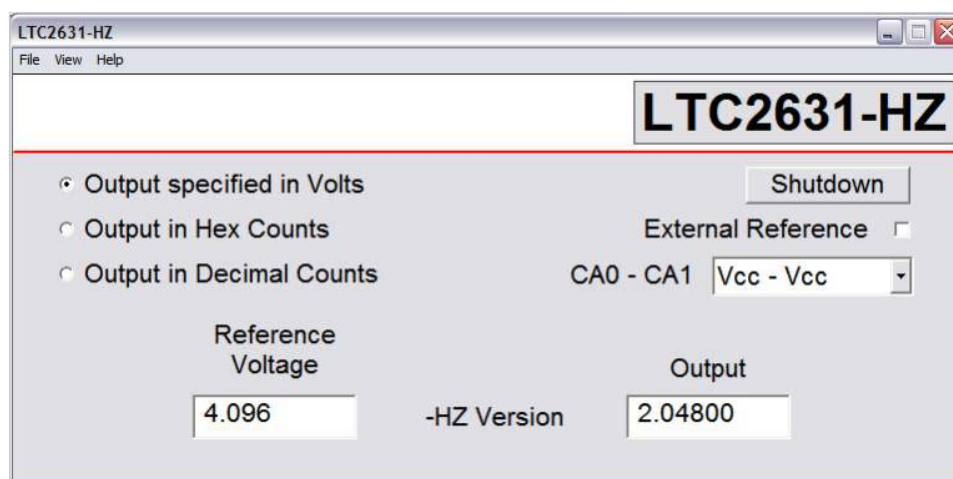


Figure 2. QuikEval Software

HARDWARE SETUP

JUMPERS

CA0: This sets the I²C address of the LTC2631. These should be set to 1 (V_{CC}) by default.

CA1/REF_SEL: On the B and D versions of the demo board, this is used to determine the I²C address of the LTC2631. On the A and C versions of the demo board, this is used to determine the reference input.

ANALOG CONNECTIONS

DAC outputs are provided on the row of turret posts at the edge of the board.

GROUNDING AND POWER CONNECTIONS

Power (V_{CC}): Normally, the DC1332B is powered by the DC590 controller. V_{CC} can be supplied to the 5V turret, however the power supply on the DC590 must be disabled! Refer to the DC590 Quick Start Guide for more details on this mode of operation.

Grounding: Three ground posts are provided.

PARTS LIST

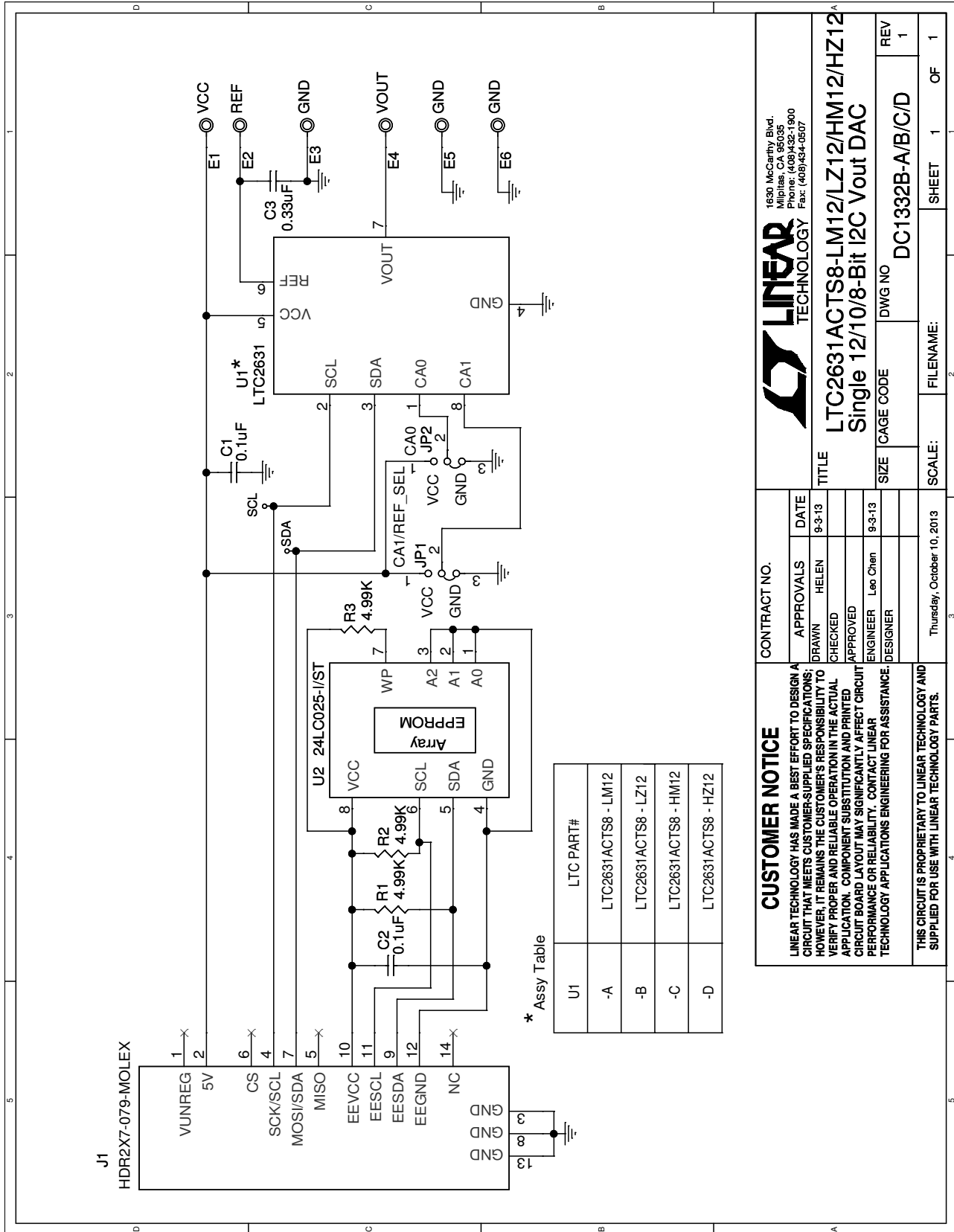
ITEM	QTY	REFERENCE	PART DESCRIPTION	MANUFACTURER/PART NUMBER
DC1332B Required Circuit Components				
1	2	C1, C2	CAP., X7R, 0.1µF, 16V, 10%, 0603	AVX, 0603YC104KAT
2	1	J1	HEADER, 2×7 PIN, 0.079"	MOLEX, 87831-1420
3	3	R1, R2, R3	RES., CHIP, 4.99k, 1/16W, 1%, 0603	VISHAY, CRCW06034K99FKEA
4	1	U2	IC, 24LC025ST, TSSOP	MICROCHIP, 24LC025-I/ST
Hardware: For Demo Board Only				
1	6	E1-E6	TESTPOINT, TURRET, 0.095"	MILL-MAX, 2501-2-00-80-00-00-07-0
2	2	JP1, JP2	0.1" SINGLE ROW HEADER, 3-PIN	SAMTEC, TSW-103-07-L-S
3	2	JP1, JP2	SHUNT, 1" BLK	SAMTEC, SNT-100-BK-G
DC1332B-A				
5	1	U1	IC, LTC2631ACTS8-LM12#PBF, TSOT-23	LINEAR TECHNOLOGY, LTC2631ACTS8-LM12#PBF
DC1332B-B				
5	1	U1	IC, LTC2631ACTS8-LZ12#PBF, TSOT-23	LINEAR TECHNOLOGY, LTC2631ACTS8-LZ12#PBF
DC1332B-C				
5	1	U1	IC, LTC2631ACTS8-HM12#PBF, TSOT-23	LINEAR TECHNOLOGY, LTC2631ACTS8-HM12#PBF
DC1332B-D				
5	1	U1	IC, LTC2631ACTS8-HZ12#PBF, TSOT-23	LINEAR TECHNOLOGY, LTC2631ACTS8-HZ12#PBF

DEMO MANUAL DC1332B

REVISION HISTORY (Revision history begins at Rev B)

BOARD REV	DATE	DESCRIPTION	PAGE NUMBER
B	10/13	Add C3	All

SCHEMATIC DIAGRAM



		1630 McCarthy Blvd. Milpitas, CA 95035 Phone: (408)432-1900 Fax: (408)434-0507	
		TITLE LTC2631ACTS8-LM12/LZ12/HM12/HZ12^A Single 12/10/8-Bit I2C Vout DAC	
CONTRACT NO.		DATE 9-3-13	
APPROVALS DRAWN HELEN CHECKED APPROVED ENGINEER Leo Chen DESIGNER		SIZE CAGE CODE DWG NO DC1332B-A/B/C/D	
THIS CIRCUIT IS PROPRIETARY TO LINEAR TECHNOLOGY AND SUPPLIED FOR USE WITH LINEAR TECHNOLOGY PARTS.		SCALE: Thursday, October 10, 2013	
CUSTOMER NOTICE LINEAR TECHNOLOGY HAS MADE A BEST EFFORT TO DESIGN A CIRCUIT THAT MEETS CUSTOMER-SUPPLIED SPECIFICATIONS; HOWEVER, IT REMAINS THE CUSTOMER'S RESPONSIBILITY TO VERIFY PROPER AND RELIABLE OPERATION IN THE ACTUAL APPLICATION. COMPONENT SUBSTITUTION AND PRINTED CIRCUIT BOARD LAYOUT MAY SIGNIFICANTLY AFFECT CIRCUIT PERFORMANCE OR RELIABILITY. CONTACT LINEAR TECHNOLOGY APPLICATIONS ENGINEERING FOR ASSISTANCE.		FILENAME: SHEET 1 OF 1	

Figure 3. LTC2631 Schematic Diagram

DEMO MANUAL DC1332B

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If this evaluation kit does not meet the specifications recited in the DEMO BOARD manual the kit may be returned within 30 days from the date of delivery for a full refund. **THE FOREGOING WARRANTY IS THE EXCLUSIVE WARRANTY MADE BY THE SELLER TO BUYER AND IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED, IMPLIED, OR STATUTORY, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE. EXCEPT TO THE EXTENT OF THIS INDEMNITY, NEITHER PARTY SHALL BE LIABLE TO THE OTHER FOR ANY INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES.**

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LTC currently services a variety of customers for products around the world, and therefore this transaction **is not exclusive**.

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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