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LTC2657: 16-Bit Octal Rail-to-Rail DAC with I²C Interface

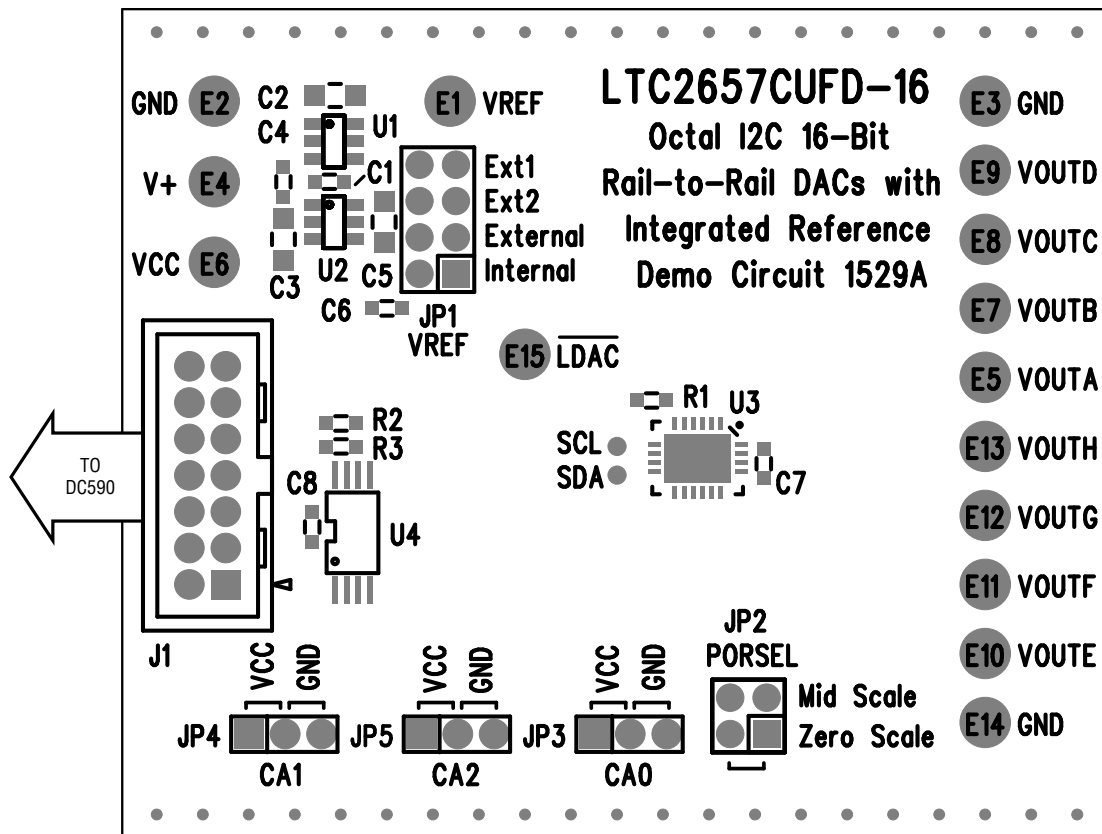
DESCRIPTION

Demonstration circuit 1529A features the [LTC2657](#) Octal 16-bit DAC with ± 4 LSB INL error. This device establishes a new board-density benchmark for 16-bit DACs and advances performance standards for output drive, cross-talk and load regulation in single supply, voltage-output multiple DACs.

DC1529A has many features for evaluating the performance of the LTC2657.

Design files for this circuit board are available at <http://www.linear.com/demo/DC1529A>

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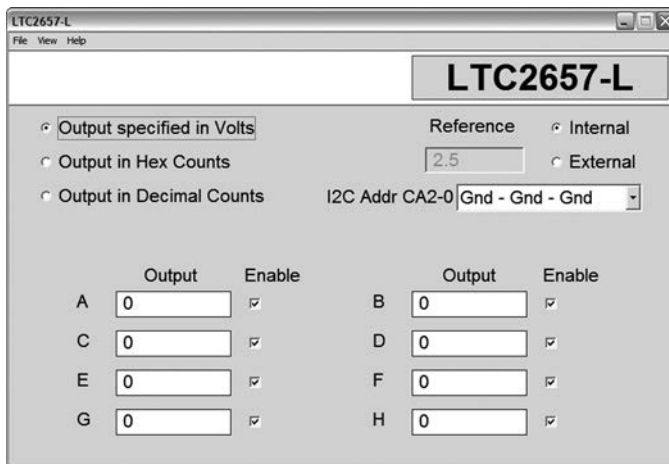
DEMO BOARD TYPE	LTC2657 VARIATION	FULL SCALE
DC1529A-A	LTC2657BCUFD-L16	2.5V
DC1529A-B	LTC2657BCUFD-H16	4.096V

QUICK START PROCEDURE

Connect DC1529A to a DC590 USB serial controller using the supplied 14 conductor ribbon cable. Connect DC590 to a host PC with a standard USB A/B cable. Run the evaluation software supplied with DC590 or download it from www.linear.com/software. The correct control panel will be loaded automatically.

If an external reference is used, click the “External” button in the control panel and enter the reference voltage in the text block.

Complete software documentation is available from the Help menu item, as features may be added periodically.



HARDWARE SETUP

Jumpers

JP1: VREF Select. Either an Internal or External reference can be selected. To drive through the VREF pin, set to External and connect a clean reference voltage to the VREF turret. Default is the internal reference.

JP2: Power-Up Mode. The LTC2657 can be set to either power-up in mid-scale or zero-scale. Default is zero-scale.

JP3, JP4, JP5: I²C Address Selection Jumpers. Set address here and double check that the address selected in software matches. By default all jumpers are tied to GND.

Analog Connections

DAC Outputs: The eight DAC outputs from the LTC2657 are brought out to turrets labeled VOUTA through VOUTH. These may be connected to external instruments or other circuitry.

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

VREF: The VREF turret is connected directly to the reference

terminals of the LTC2657. When the onboard reference is being used, the reference voltage may be monitored at this point. An external reference may also be applied to this turret after setting JP1 to External.

Grounding and Power Connections

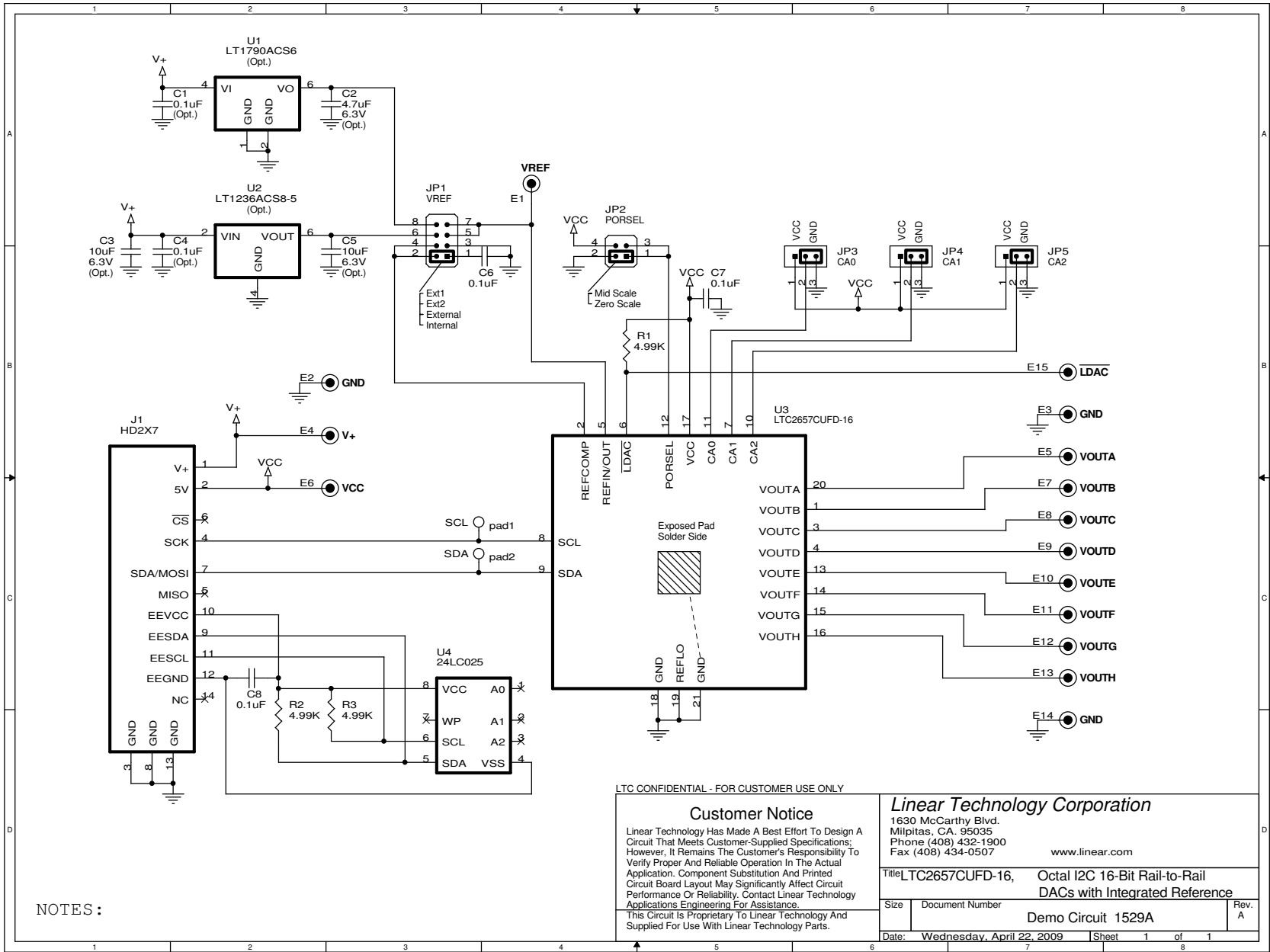
Power (V_{CC}): Normally DC1529A is powered by the DC590 controller. V_{CC} can be supplied to this turret, however the power supply on DC590 must be disabled! Refer to DC590 Quick Start Guide for more details on this mode of operation.

Grounding: There is one common ground plane on the board. All GND pins on the LTC2657 are tied to this ground plane through low impedance paths. Use the GND turrets as a reference point for measurements and connections to external circuits. Two bare ground strips are provided on the top and the bottom of the demo board.

DEMO MANUAL DC1529A

PARTS LIST

ITEM	QTY	REFERENCE	PART DESCRIPTION	MANUFACTURER/PART NUMBER
Required Circuit Components				
1	3	C6, C7, C8	CAP., CHIP X7R 0.1 μ F 16V 0603	AVX, 0603YC104MAT1A
2	0	C1, C4 (Opt.)	CAP., CHIP X7R 0.1 μ F 16V 0603	AVX, 0603YC104MAT1A
3	0	C2 (Opt.)	CAP., CHIP X5R 4.7 μ F 6.3V 0805	TAIYO YUDEN, JMK212BJ475MG
4	0	C3, C5 (Opt.)	CAP., CHIP X5R 10 μ F 6.3V 0805	TDK, C2012X5R0J106M
5	15	E1-E15	TURRET, TESTPOINT 0.064"	MILL-MAX, 2308-2
6	0	PAD1, PAD2	Opt.	
7	3	JP3-JP5	HEADER, 3-PIN 1 ROW 0.079CC	SAMTEC, TMM-103-02-L-S
8	1	JP2	HEADER, 2-PIN 2 ROW 0.079CC	SAMTEC, TMM-102-02-L-D
9	1	JP1	HEADER, 2-PIN 4 ROW 0.079CC	SAMTEC, TMM-104-02-L-D
10	5	FOR (JP1-JP5)	SHUNT, 0.079" CENTER	SAMTEC, 2SN-BK-G
11	1	J1	HEADER, VERTICAL DUAL 2X7 0.079CC	MOLEX, 87831-1420
12	3	R1-R3	RES., CHIP 4.99K 1% 0603	VISHAY, CRCW06034K99FKEA
13	0	U1 (Opt.)	I.C., MICROPOWER SOT-23 LOW DROPOUT	LINEAR TECH., LT1790ACS6
14	0	U2 (Opt.)	I.C., PRECISION REFERENCE	LINEAR TECH., LT1236ACS8-5
15	1	U4	I.C., SERIAL EEPROM, TSSOP-8	MICROCHIP, 24LC025-I/ST
DC1529A-A Required Circuit Components				
16	1	U3	I.C., LTC2657BCUFD-L16, UFD-20	LINEAR TECH., LTC2657BCUFD-L16#
DC1529A-B Required Circuit Components				
16	1	U3	I.C., LTC2657BCUFD-H16, UFD-20	LINEAR TECH., LTC2657BCUFD-H16#



NOTES:

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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.
This Circuit Is Proprietary To Linear Technology And Supplied For Use With Linear Technology Parts.

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Title LTC2657CUFD-16, Octal I2C 16-Bit Rail-to-Rail DACs with Integrated Reference

Size Document Number Demo Circuit 1529A Rev. A

Date: Wednesday, April 22, 2009 Sheet 1 of 1

DEMO MANUAL DC1529A

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

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