

# LTC2636

## Octal 12-Bit SPI $V_{OUT}$ DACs with 10ppm/ $^{\circ}$ C Internal Reference

### DESCRIPTION

Demonstration circuit 1466B features the [LTC<sup>®</sup>2636](#) Octal 12-bit DAC. This device has an integrated, high accuracy, low-drift reference. It has a rail-to-rail output buffer and is guaranteed monotonic. This DAC communicates through the simple SPI compatible interface.

Design files for this circuit board are available at <http://www.linear.com/demo/DC1466B>

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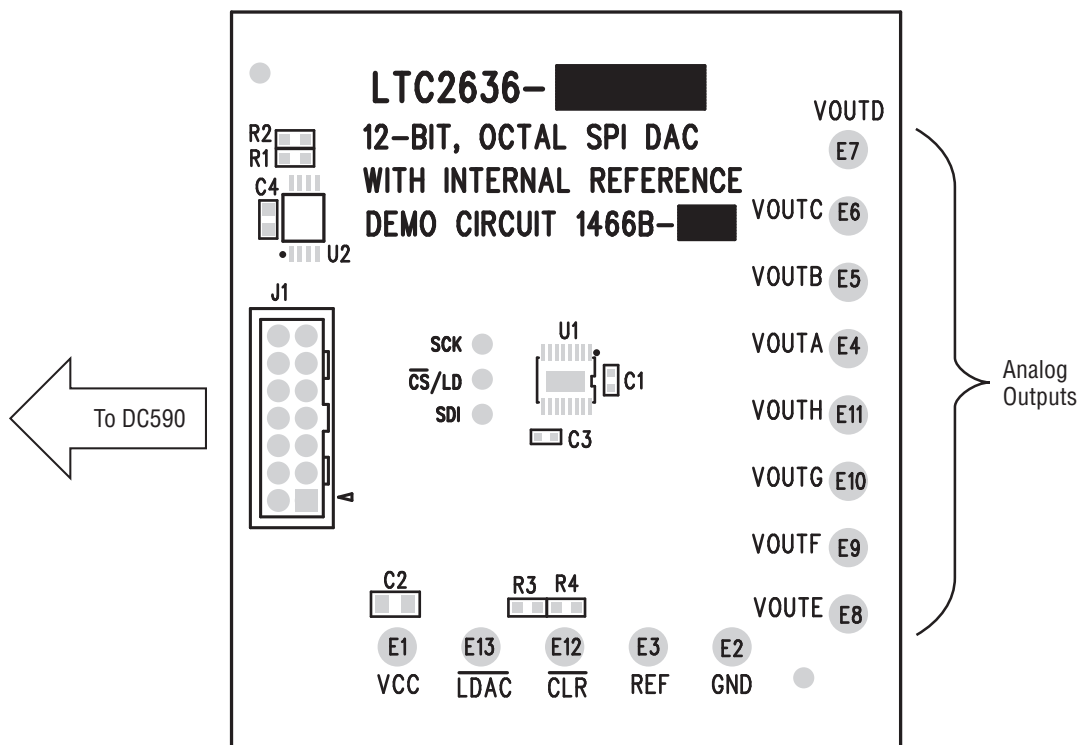


Figure 1

Table 1.

DEMO BOARD TYPE	LTC2636 VARIATION (SUFFIX)	POWER-UP OUTPUT	FULL-SCALE OUTPUT VOLTAGE
A	LZ	Zero	2.5V
B	LMI	Mid-Scale	2.5V
C	HZ	Zero	4.096V
D	HMI	Mid-Scale	4.096V

## QUICK START PROCEDURE

Connect DC1466B 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 QuikEval™ evaluation software supplied with DC590 or download it from [www.linear.com/software](http://www.linear.com/software). The correct control panel will be loaded automatically. The DAC is updated as changes are made to the GUI screen. Entering a voltage into a text box will cause the DAC's output to

update immediately. Values may be entered in voltage, hexadecimal counts, or decimal counts by selecting the appropriate radio button. The reference mode may also be changed, and individual DACs can be powered down by unchecking the "Enable" box.

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

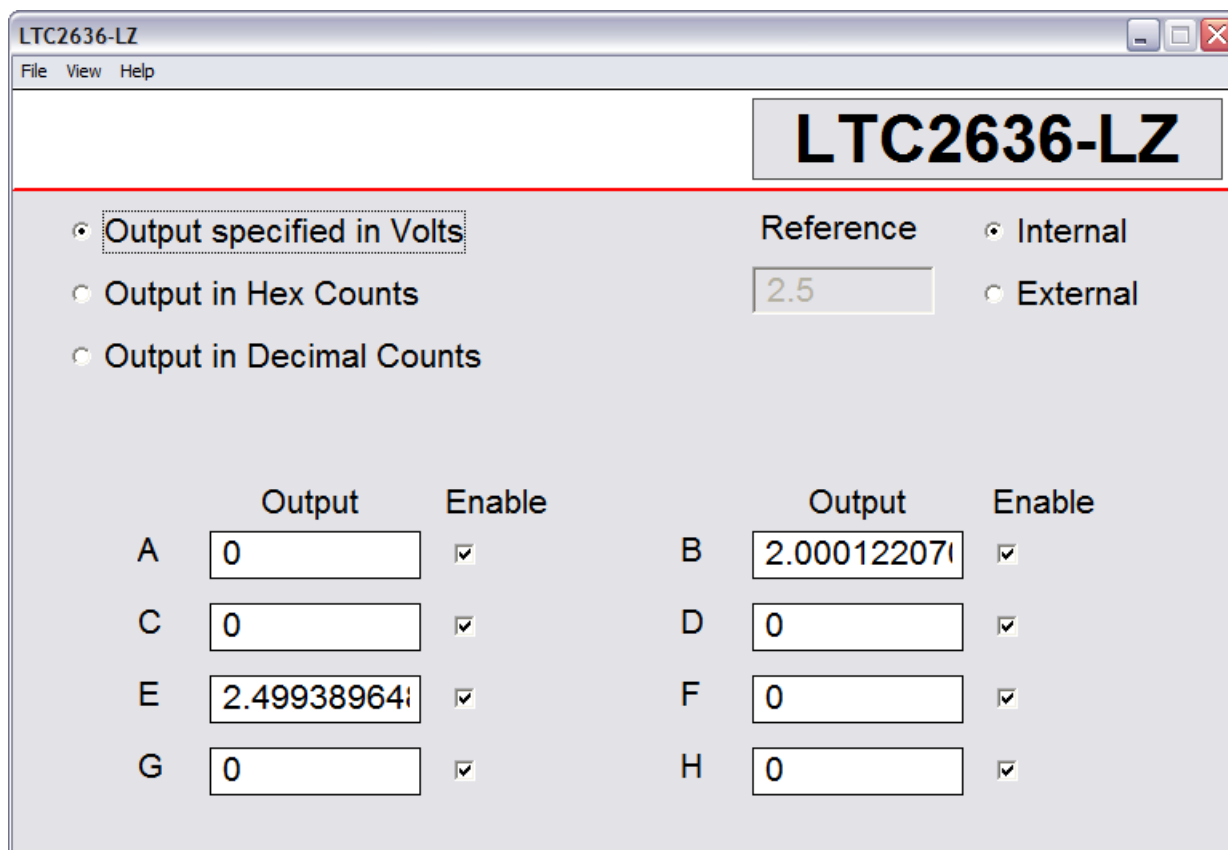


Figure 2

## HARDWARE SETUP

### Analog Connections

**DAC Outputs** – The eight DAC outputs from the LTC2636 are brought out to turrets labeled VOUTA through VOUTH. These may be connected to external instruments or other circuitry.

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

**REF** – The REF turret is connected directly to the reference pin of the LTC2636. When the integrated reference is being used, the reference voltage may be monitored at this point. An external reference may also be applied to this turret after changing the setting in the evaluation software.

### Digital Connections

**$\overline{\text{LDAC}}$**  – Load pin, active low, pulled to  $V_{CC}$  by a 10k resistor. Updates the DAC register from the Input register. Do not assert this pin when using with the evaluation software. This pin can be used to update all DACs simultaneously, after individual input registers have been written to.

**$\overline{\text{CLR}}$**  – Clear pin, active low, pulled to  $V_{CC}$  by a 10k resistor. Asserting this pin clears all DACs to their default power-up value.

### Grounding and Power Connections

**Power ( $V_{CC}$ )** – Normally DC1466 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** – Ground turrets as well as 2 grounding strips are provided.

# DEMO MANUAL DC1466B

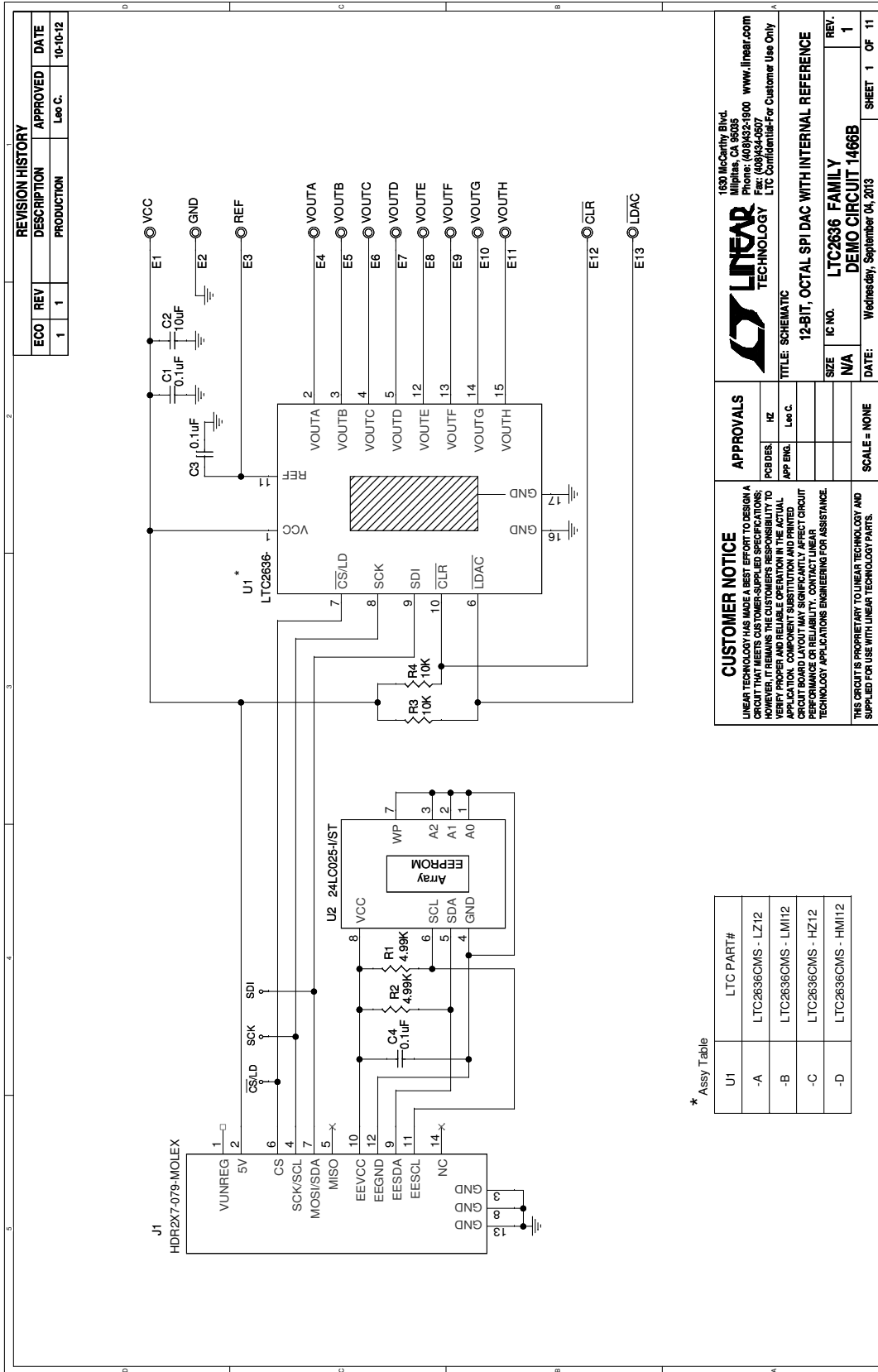
## PARTS LIST

ITEM	QTY	REFERENCE	PART DESCRIPTION	MANUFACTURER/PART NUMBER
<b>Parts List – All Assembly Types</b>				
1	2	C1, C3	CAP., X5R, 0.1 $\mu$ F, 16V, 10%, 0402	AVX, 0402YD104KAT
2	1	C4	CAP., X7R, 0.1 $\mu$ F, 16V, 10%, 0603	AVX, 0603YC104KAT
3	1	C2	CAP., X5R, 10 $\mu$ F, 16V, 10%, 0805	AVX, 0805YD106KAT
4	13	E1–E13	TESTPOINT, TURRET, 0.065"	MILL-MAX, 2308-2-00-80-00-00-07-0
5	1	J1	HEADER, 2 $\times$ 7 PIN, 0.079CC	MOLEX, 87831-1420
6	2	R1, R2	RES., CHIP, 4.99k, 1/16W, 1%, 0603	VISHAY, CRCW06034K99FKEA
7	2	R3, R4	RES., CHIP, 10k, 1/16W, 1%, 0603	VISHAY, CRCW06010K0FKEA
8	1	U2	IC, EEPROM 2k BIT 400kHz 8 TSSOP	MICROCHIP, 24LC025-I/ST
<b>Parts List – DC1466B-A</b>				
2	1	U1	LTC2636CMS-LZ12#PBF, MSOP 16-PIN	LINEAR TECH., LTC2636CMS-LZ12#PBF
<b>Parts List – DC1466B-B</b>				
2	1	U1	LTC2636CMS-LMI12#PBF, MSOP 16-PIN	LINEAR TECH., LTC2636CMS-LMI12#PBF
<b>Parts List – DC1466B-C</b>				
2	1	U1	LTC2636CMS-HZ12#PBF, MSOP 16-PIN	LINEAR TECH., LTC2636CMS-HZ12#PBF
<b>Parts List – DC1466B-D</b>				
2	1	U1	LTC2636CMS-HMI12#PBF, MSOP 16-PIN	LINEAR TECH., LTC2636CMS-HMI12#PBF

## BOARD REVISION HISTORY

BOARD REV	DATE	DESCRIPTION
A		Original Design
B	10/13	Connected Floating Address Lines on ID EEPROM.

**SCHEMATIC DIAGRAM**



REVISION HISTORY		
ECO	REV	DESCRIPTION
1	1	PRODUCTION

APPROVED	DATE
Leo C.	10-10-12

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**LINEAR TECHNOLOGY**

TITLE: SCHEMATIC  
 12-BIT, OCTAL SPI DAC WITH INTERNAL REFERENCE

SIZE	IC NO.	REV.
NA	LTC2636 FAMILY	1

DATE: Wednesday, September 04, 2013 SHEET 1 OF 11

SCALE = NONE

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

\* Assy Table

U1	LTC PART#
-A	LTC2636CMS - LZ12
-B	LTC2636CMS - LM12
-C	LTC2636CMS - HZ12
-D	LTC2636CMS - HM12



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# DEMO MANUAL DC1466B

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