

New 16-Bit Bipolar Output DAC in Narrow SO-16 Package

by Hassan Malik


Linear Technology introduces its first bipolar, voltage output 16-bit digital to analog converter, the LTC1650. The LTC1650 is available in a narrow 16-pin SO package, making it the smallest bipolar, 16-bit voltage output DAC on the market today. The LTC1650 operates from $\pm 5V$ supplies and draws 5mA. It is equipped with a rail-to-rail, low noise, deglitched output amplifier that can be configured to operate in a unipolar or bipolar mode. The mid-scale glitch is under 2nV-s and the full-scale settling time in unipolar mode is 4 μ s.

The LTC1650 is 16-bit monotonic over the industrial temperature range,

with a typical differential nonlinearity of less than $\pm 0.3\text{LSB}$. Figures 1 and 2 show a typical application for the part and its DNL curve. The LTC1650 is equipped with an output-span-setting resistor tied to the UNI/BIP pin. When this pin is tied to the V_{OUT} pin, the output will swing from REFLO to REFHI; when the pin is tied to REFHI, the output swings from $-\text{REFHI}$ to REFHI.

The LTC1650 has a user-defined voltage to which its output resets on power-up or when the part is cleared. The voltage on the V_{RST} pin is applied to the output through a transmission gate when the part powers up or is

cleared. There are supply brown-out detectors on all three supplies, AV_{DD} , DV_{DD} and AV_{SS} . When any of these supplies drops below 2.5V, the part is cleared, connecting the output to V_{RST} , and the RSTOUT pin changes to a logic low.

The 3-wire serial interface of the LTC1650 is SPI/QSPI and MICRO-WIRE™ compatible. All the logic inputs are TTL/CMOS compatible and the CLK input is equipped with a Schmitt trigger that allows direct optocoupler interfacing. There is also a D_{OUT} pin for daisy-chaining several DACs. The digital feedthrough is 0.05nV-s. 

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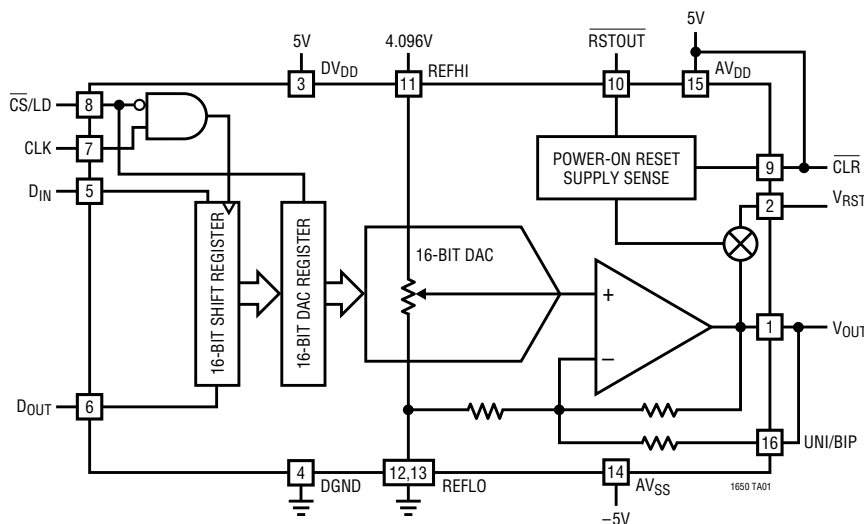


Figure 1. LTC1650 block diagram

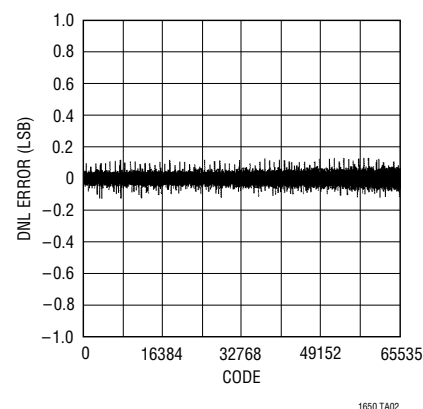


Figure 2. The LTC1650 bipolar output DAC has $\pm 0.3\text{LSB}$ typical DNL.