



DESIGN NOTES

LTC1390: A Versatile 8-Channel Multiplexer – Design Note 112

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Introduction

Available in either 16-pin DIP or narrow body SOIC packages, the CMOS LTC[®]1390 is a high performance 8-to-1 analog multiplexer. It is addressed through a 3-wire digital interface featuring bidirectional serial data.

The LTC1390 features a typical on-resistance of 45 Ω , typical switch leakage of 50pA and guaranteed break-before-make switch operation. Charge injection is ± 10 pC (max). All digital inputs remain logic compatible whether operating on single or dual supplies. The inputs are robust, easily withstanding 100mA fault currents. The

LTC1390 operates over a wide power supply voltage range of 3V to ± 15 V.

Low Power, Daisy-Chain Serial Interface, 8-Channel A/D System

Figure 1 shows the LTC1390 connected to the LTC1286 12-bit micropower A/D converter. The Clock (CLK) and Chip Select (CS) signals are connected in parallel to the LTC1390 and LTC1286. Both the LTC1390 and the LTC1286 are designed for serial data transfer. The LTC1390 also includes provisions for daisy-chain operation. This

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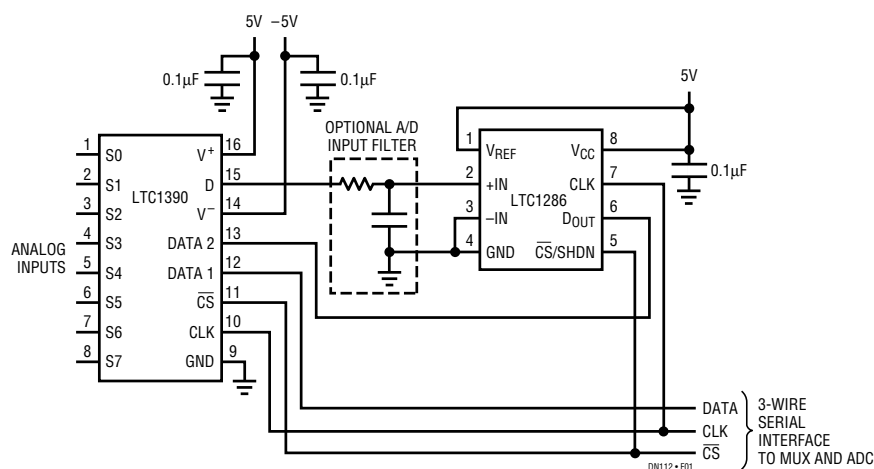


Figure 1. The LTC1390 Expands the 12-Bit Micropower LTC1286 ADC Input Capacity to Eight Channels

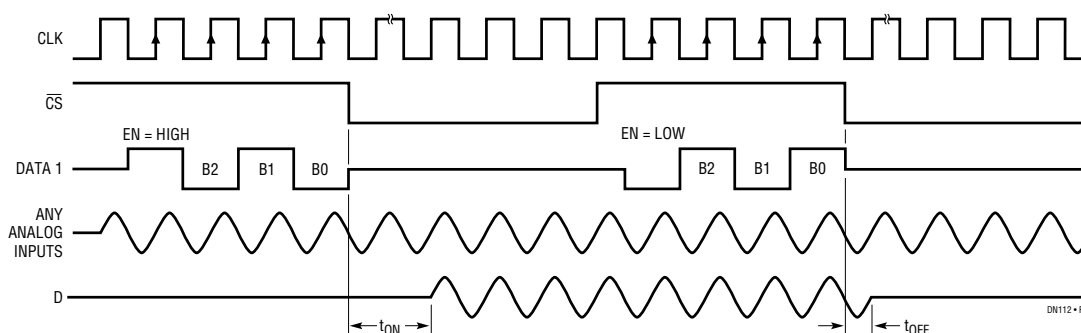


Figure 2. The LTC1390 Clocks in Data While CS is High and Latches the Data, Enabling the Selected Channel, When CS Goes low

Figure 4 shows an active 2nd order lowpass filter connected between the LTC1390 output and the LTC1286 input. The heart of the lowpass filter is the single supply

The LTC1390 provides designers of a serially interfaced data acquisition system with a flexible, low power and cost-effective way to expand the number of A/D channels.

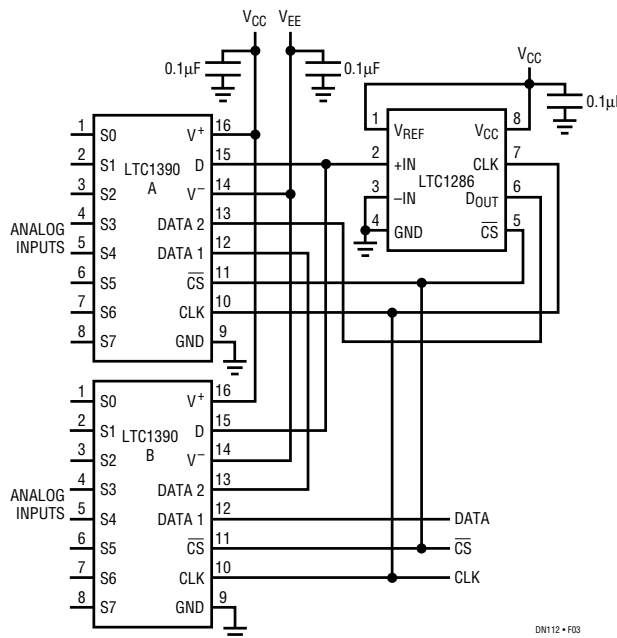


Figure 3. Additional Multiplexer Channels Are Easy to Add Without Adding Additional Serial Lines

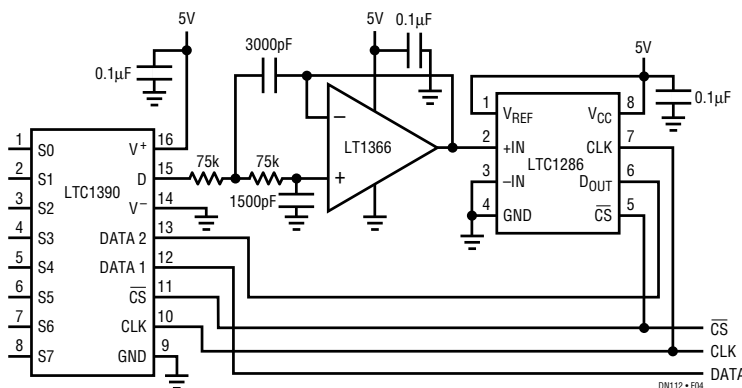


Figure 4. The Connection Between the LTC1390 Output and the LTC1286 Input Is the Perfect Place for Signal Conditioning Circuits Such as the LT1366-Based 2nd Order Active Lowpass Filter

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