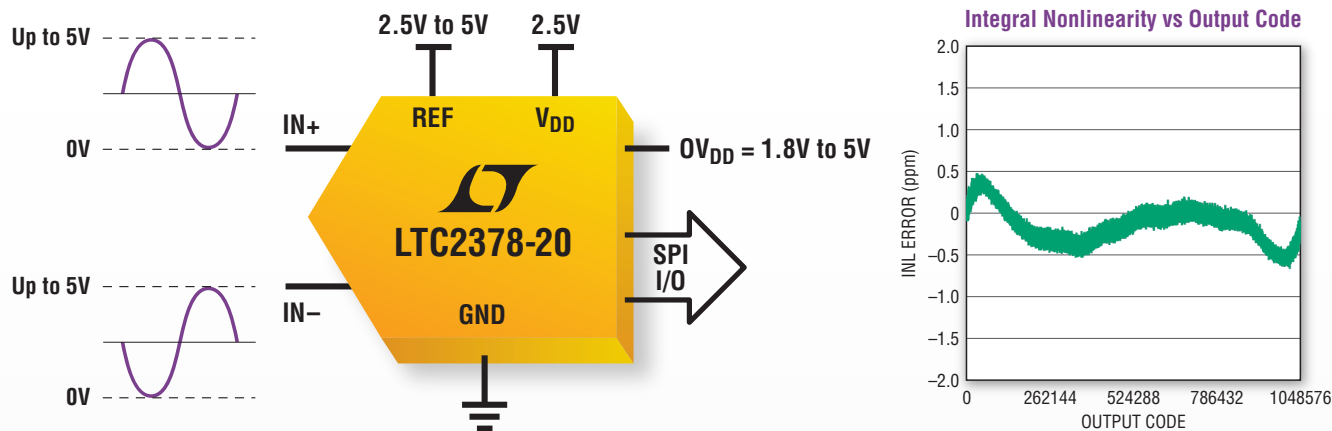


20-Bit 1Msps SAR ADC

0.5ppm INL



No Latency SAR ADC Achieves 104dB SNR

The LTC®2378-20 SAR ADC achieves 20 bits of resolution with outstanding 0.5ppm INL and 104dB SNR performance with no cycle latency and sample rates up to 1Msps. The LTC2378-20 offers uncompromised performance, low power dissipation and excellent temperature stability for high precision signal chains. The unique digital gain compression feature eliminates the need for a negative ADC driver supply while preserving the full resolution of the ADC, dramatically lowering the total power consumption of the signal chain. The LTC2378-20 family includes pin-compatible 20-/18-/16-bit SAR ADCs from 250ksps to 2Msps with serial SPI interface and explicit Busy and Chain pins that simplify digital timing.

Features

- 1Msps Throughput Rate
- $\pm 0.5\text{ppm}$ INL (Typ), $\pm 2\text{ppm}$ INL (Max)
- 104dB SNR (Typ) at $f_{\text{IN}} = 2\text{kHz}$
- -125dB THD (Typ) at $f_{\text{IN}} = 2\text{kHz}$
- Low Power: 21mW at 1Msps, 21 μ W at 1ksps
- Fully Differential Input Range $\pm V_{\text{REF}}$
- V_{REF} Input Range from 2.5V to 5.1V
- Digital Gain Compression
- -40°C to 85°C Guaranteed Temperature Range
- 16-Pin MSOP and 4mm x 3mm DFN Packages

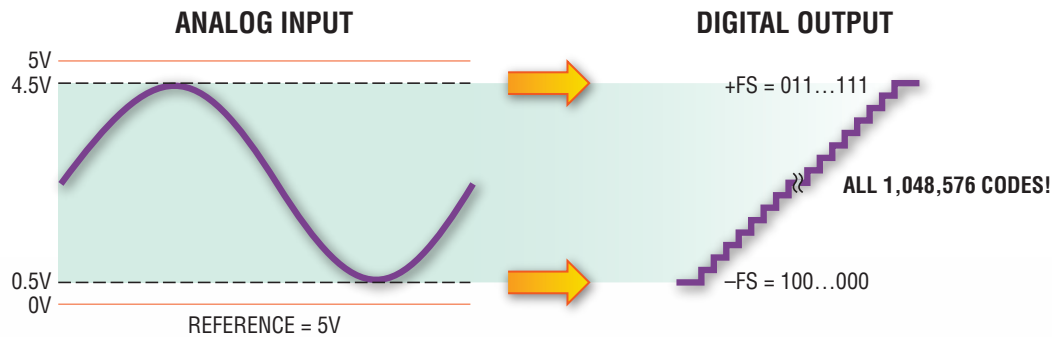
Complete 20-Bit/18-Bit/16-Bit Pin-Compatible SAR ADC Family

	250ksps	500ksps	1Msps	1.6Msps	2Msps
20-Bit 104dB SNR	2376-20	2377-20	2378-20		
18-Bit 101dB SNR	2376-18	2377-18	2378-18	2379-18	
16-Bit 96dB SNR	2376-16	2377-16	2378-16		2380-16



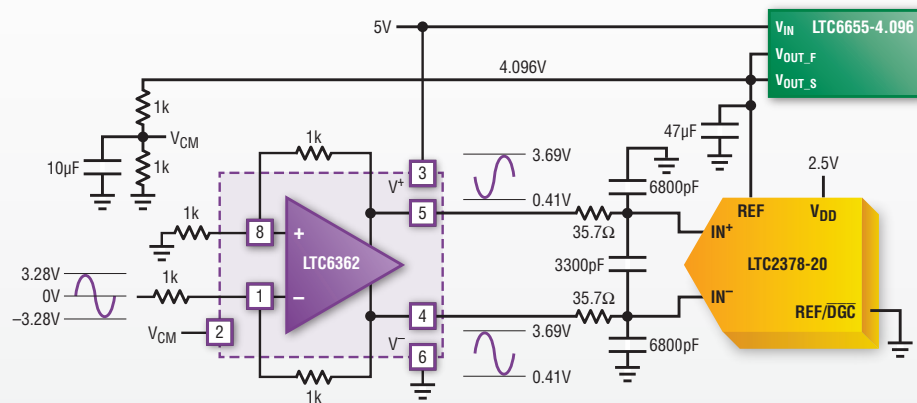
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Digital Gain Compression



The LTC2378-20 family offers the digital gain compression (DGC) feature, which eliminates the driver amplifier's negative supply while preserving the full resolution of the ADC. When enabled, the ADC performs a digital scaling function that maps zero-scale code from $0V$ to $0.1 \cdot V_{REF}$ and full-scale code from V_{REF} to $0.9 \cdot V_{REF}$ allowing the amplifier to operate from a single positive supply. The elimination of the negative supply dramatically reduces the total power consumption of the signal chain and reduces component count while simplifying the design.

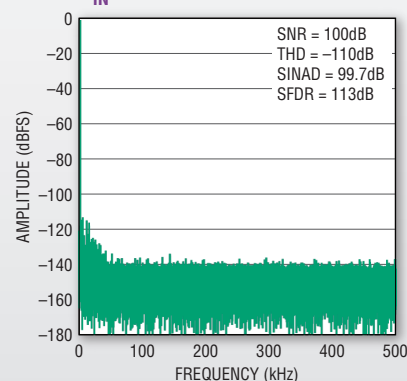
LTC6362 Precision, Low Power SAR ADC Driver



Features

- 1mA Supply Current
- Single 2.8V to 5.25V Supply
- Single-Ended or Fully Differential Input
- Fully Differential Output
- 200μV Max Offset Voltage
- 260nA Max Input Bias Current
- Fast Settling: 550ns to 18-Bit, $8V_{P-P}$ Output
- Low Distortion: $-116dBc$ at 1kHz, $8V_{P-P}$
- Rail-to-Rail Inputs and Outputs
- Low Power Shutdown: 70μA
- 8-Lead MSOP and 3mm × 3mm 8-Lead DFN Packages

128k Point FFT Plot with
 $f_{IN} = 2kHz$ for Circuit Shown Above



The LTC®6362 fully differential amplifier achieves high precision on a tight power budget. The LTC6362 can drive 16-, 18- and 20-bit SAR ADCs on a single 5V, 1mA supply. The LTC6362 easily scales and shifts AC- or DC-coupled signals to the input range of the ADC. It is ideal for driving the 20-bit 1Msps LTC2378-20 SAR ADC with the digital gain compression feature. When paired with the LTC6655-4.096 for the reference, the entire signal chain solution can be powered from a single 5V supply, minimizing power consumption, reducing complexity and achieving up to 100dB of SNR.