

## Dual Channel 14-Bit CCD Signal Processor with V-Driver and *Precision Timing* Generator

# AD9928

#### FEATURES

Registers similar to AD9920A and AD9990 Timing generator with 18-channel V-driver Serial data output with reduced range LVDS interface 1.8 V dual AFE core Internal LDO regulators for compatibility with 3 V systems Correlated double sampler (CDS) with -3 dB, 0 dB, +3 dB, and +6 dB gain 6 dB to 42 dB, 10-bit variable gain amplifier (VGA) 14-bit, 40 MHz analog-to-digital converter (ADC) Black level clamp with variable level control *Precision Timing* core with ~390 ps resolution at 40 MHz On-chip 3 V horizontal and RG drivers General-purpose outputs (GPOs) for shutter support On-chip driver for external crystal 128-ball CSP\_BGA package, 9 mm × 9 mm, 0.65 mm pitch

#### **APPLICATIONS**

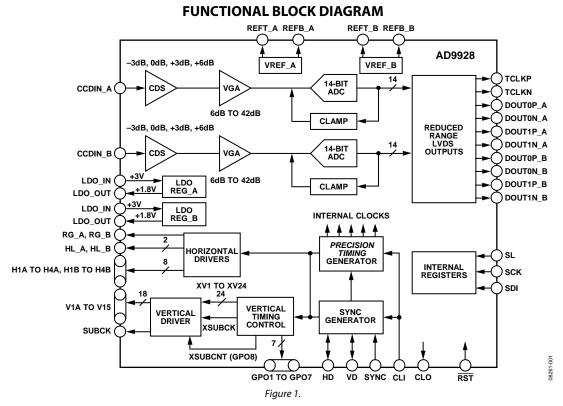
Digital still cameras Medical imaging Industrial cameras

### **GENERAL DESCRIPTION**

The AD9928 is a highly integrated CCD signal processor for digital still camera applications. It includes a dual analog front end with analog-to-digital conversion, combined with a fullfunction programmable timing generator and 18-channel vertical driver (V-driver) for a 2-channel output CCD. The timing generator is capable of supporting up to 24 vertical clock signals internally, and the on-chip V-driver supports up to 18 high voltage outputs. A *Precision Timing*<sup>™</sup> core allows adjustment of high speed clocks with approximately 390 ps resolution at 40 MHz operation. The AD9928 also contains eight generalpurpose outputs, which can be used for shutter and system functions.

Each analog front end includes black level clamping, CDS, VGA, and a 14-bit ADC. The timing generator provides all the necessary CCD clocks: RG, H-clocks, V-clocks, sensor gate pulses, substrate clock, and substrate bias control.

The AD9928 is specified over an operating temperature range of  $-25^{\circ}$ C to  $+85^{\circ}$ C.



For more information on the AD9928, email Analog Devices, Inc., at afe.ccd@analog.com.

#### Rev. SpD

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## AD9928

## NOTES

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