



Dual-Channel, 14-Bit, CCD Signal Processor with *Precision Timing*™ Core

AD9972

- 1.8 V analog and digital core supply voltage
- 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
- Complete on-chip timing generator
- Precision Timing* core with 400 ps resolution @ 40 MHz
- On-chip 3 V horizontal and RG drivers
- 100-lead, 9 mm × 9 mm, 0.8 mm pitch, CSP_BGA package
- Internal LDO regulator circuitry

Professional HDTV camcorders
Professional/high end digital cameras
Broadcast cameras
Industrial high speed cameras

The AD9972 is a highly integrated, dual-channel CCD signal processor for high speed digital video camera applications. Each channel is specified at pixel rates of up to 40 MHz. The AD9972 consists of a complete analog front end with analog-to-digital conversion combined with a programmable timing driver. The *Precision Timing* core allows adjustment of high speed clocks with approximately 400 ps resolution at 40 MHz operation.

Available in a space-saving, 9 mm × 9 mm, CSP_BGA package, the AD9972 is specified over an operating temperature range of -25°C to +85°C.

The block diagram illustrates the internal architecture of the AD9972. It features two parallel signal paths for CCDIN_A and CCDIN_B. Each path includes a CDS (Correlated Double Sampling) block with gain settings of -3, 0, +3, and +6dB, followed by a VGA (Variable Gain Amplifier) block with gain settings of 6dB to 42dB. The outputs of the VGA blocks are connected to 14-bit ADCs (Analog-to-Digital Converters). The ADCs are also connected to CLAMP blocks. The outputs of the ADCs are labeled DOUT_A and DOUT_B. The device includes two LDOs (Low Dropout Regulators) providing 1.8V outputs. A PRECISION TIMING CORE provides internal clocks and is connected to the HORIZONTAL DRIVERS. The HORIZONTAL DRIVERS output signals H1_A to H4_A and H1_B to H4_B. The PRECISION TIMING CORE is also connected to a SYNC GENERATOR and INTERNAL REGISTERS. The INTERNAL REGISTERS are connected to the HORIZONTAL DRIVERS and the PRECISION TIMING CORE. The device has multiple input pins for REF_A, REF_B, REFT_A, REFT_B, and SCK_A, SCK_B. The output pins are DOUT_A, DOUT_B, and CLI_A, CLI_B.

Figure 1.

Rev. SpA

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