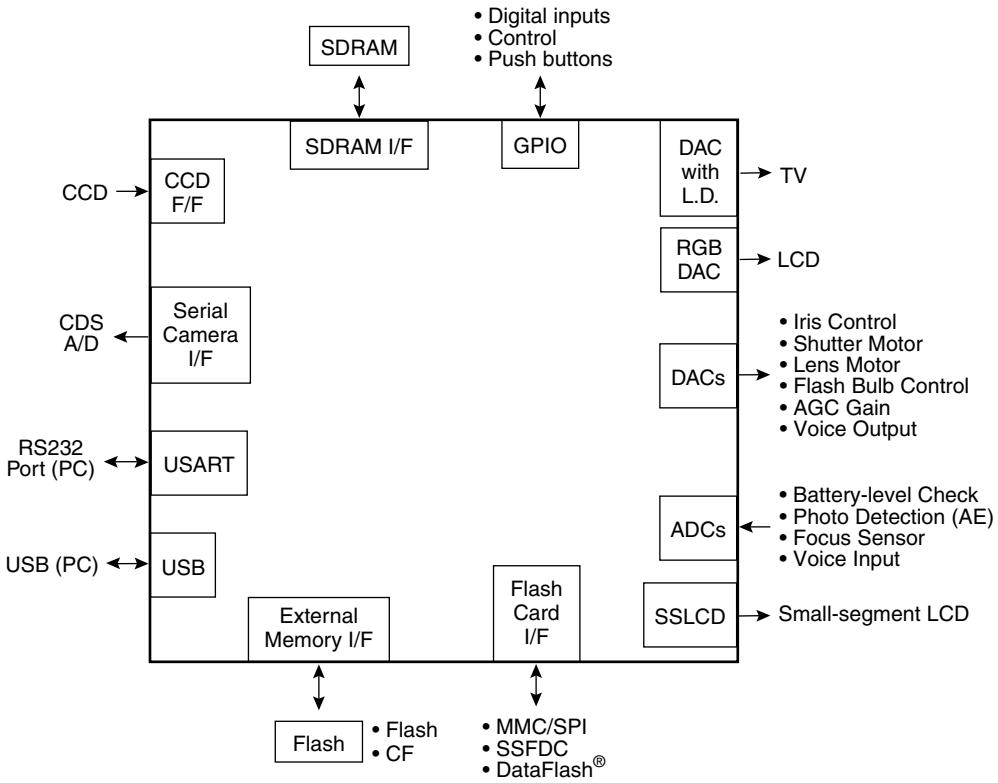
Features

- **DSP Functions for CCD/CMOS Image Processing**
- **Video Encoder, Including Line Driver for NTSC/PAL TV Signal**
- **Baseline JPEG Compression/Decompression**
- **SDRAM Interface**
- **Support for All Flash Card Interfaces (Atmel DataFlash®, MMC, SSFDC, Compact Flash)**
- **Integrated DACs for LCD**
- **USB and USART Interfaces for PC Camera Applications**
- **Small-Segment LCD Driver**
- **32 Pins for General-purpose I/O**
- **5 External Interrupts, Timer Clock Input and Wake-up Pin**
- **DACs for Camera Control Functions and Audio Output**
- **ADCs for Monitoring Camera Analog Inputs, Audio Input and Switch Input, Like Window Comparator**
- **Serial Interface for Controlling Camera Components**
- **Up to 2M Bytes Program Space**
- **Support for RTOS**
- **All Low-level Software, Application Samples are Provided**
- **Built-in Outputs Include a CVBS Output with a Line Driver, YC16-bit Digital Output, RGB 565 Digital Output, Digital Composite Output and RGB Analog Output**
- **Compatible with Various Types of Display Devices**
- **SDRAM Support from 16M Bits to 256M Bits**
- **Direct Interface to Epson and UNIPAC LCDs**
- **280-pin FlexBGA Package**
- **3.3-volt Core and I/O Operation**

Figure 1. Typical DSC Application Using AT76C110



High-Performance Digital Camera Processor

AT76C110

Summary

Rev. 1475AS–IMAGE–06/02

Note: This is a summary document. A complete document is available under NDA. For more information, please contact your local Atmel sales office.

Description

The AT76C110 is a highly integrated solution for digital cameras. It combines a number of functions that are required in implementing digital cameras:

- Image data acquisition and capturing from either CCD or CMOS imagers
- Image display
- Image processing and image storing
- Overall camera management
- Control of general-purpose I/O functions
- Data communication
- Control of user functions
- On-screen display

It also provides a large number of interfaces that allow camera manufacturers to directly access a variety of devices that may be present in a digital camera.

- Communication with PCs
- Communication with Flash cards
- Serial communication ports for controlling other devices in the camera

The design is based on an ARM® microprocessor that controls the entire chip. A number of hardware resources, controlled by ARM, perform digital camera functions such as image DSP processing, JPEG coding/decoding, DMA access to SDRAM and video encoding. All these computation-intensive functions are implemented in hardware which can be programmed according to user specifications, thus allowing ARM to be free for other user-defined functions.

Capabilities

- Supports up to 16 megapixel CCDs/CMOS (10 - 30 MHz CCDs)
- CCD colors are limited to the Bayer arrangements of the RGB primary colors
- Interfaces to 16 - 256-Mbit SDRAM, one or two pieces
- 30 frames/sec video display mode (NTSC)
- 15 frames/sec capture mode (VGA resolution)
- Up to 1.5M bytes/sec read/write from/to Flash cards
- 2M bytes external Flash ROM for program space
- 2M bytes external SRAM for program/working space (optional)
- Full-speed USB interface (mass storage, and image class)
- 100 - 150 mA current
- 1 - 5 mA in standby mode
- 50 µA current in sleep mode

Atmel Headquarters

Corporate Headquarters
2325 Orchard Parkway
San Jose, CA 95131
TEL 1(408) 441-0311
FAX 1(408) 487-2600

Europe
Atmel Sarl
Route des Arsenaux 41
Case Postale 80
CH-1705 Fribourg
Switzerland
TEL (41) 26-426-5555
FAX (41) 26-426-5500

Asia
Room 1219
Chinachem Golden Plaza
77 Mody Road Tsimshatsui
East Kowloon
Hong Kong
TEL (852) 2721-9778
FAX (852) 2722-1369

Japan
9F, Tonetsu Shinkawa Bldg.
1-24-8 Shinkawa
Chuo-ku, Tokyo 104-0033
Japan
TEL (81) 3-3523-3551
FAX (81) 3-3523-7581

Atmel Operations

Memory
2325 Orchard Parkway
San Jose, CA 95131
TEL 1(408) 441-0311
FAX 1(408) 436-4314

Microcontrollers
2325 Orchard Parkway
San Jose, CA 95131
TEL 1(408) 441-0311
FAX 1(408) 436-4314

La Chantrerie
BP 70602
44306 Nantes Cedex 3, France
TEL (33) 2-40-18-18-18
FAX (33) 2-40-18-19-60

ASIC/ASSP/Smart Cards
Zone Industrielle
13106 Rousset Cedex, France
TEL (33) 4-42-53-60-00
FAX (33) 4-42-53-60-01

1150 East Cheyenne Mtn. Blvd.
Colorado Springs, CO 80906
TEL 1(719) 576-3300
FAX 1(719) 540-1759

Scottish Enterprise Technology Park
Maxwell Building
East Kilbride G75 0QR, Scotland
TEL (44) 1355-803-000
FAX (44) 1355-242-743

RF/Automotive
Theresienstrasse 2
Postfach 3535
74025 Heilbronn, Germany
TEL (49) 71-31-67-0
FAX (49) 71-31-67-2340

1150 East Cheyenne Mtn. Blvd.
Colorado Springs, CO 80906
TEL 1(719) 576-3300
FAX 1(719) 540-1759

Biometrics/Imaging/Hi-Rel MPU/
High Speed Converters/RF Datacom
Avenue de Rochepleine
BP 123
38521 Saint-Egreve Cedex, France
TEL (33) 4-76-58-30-00
FAX (33) 4-76-58-34-80

e-mail
literature@atmel.com

Web Site
http://www.atmel.com

© Atmel Corporation 2002.
Atmel Corporation makes no warranty for the use of its products, other than those expressly contained in the Company's standard warranty which is detailed in Atmel's Terms and Conditions located on the Company's web site. The Company assumes no responsibility for any errors which may appear in this document, reserves the right to change devices or specifications detailed herein at any time without notice, and does not make any commitment to update the information contained herein. No licenses to patents or other intellectual property of Atmel are granted by the Company in connection with the sale of Atmel products, expressly or by implication. Atmel's products are not authorized for use as critical components in life support devices or systems.

ATMEL® and DataFlash® are the registered trademark of Atmel.

ARM7TDMI®, ARM®, Thumb® and AMBA™ are the trademarks (or registered trademarks) of ARM, Ltd.

Microsoft®, Windows® 98/CE and Windows NT® are the registered trademarks of Microsoft Corporation; Sun-Solaris™ is trademark of Sun Corporation. Other terms and product names may be the trademarks of others.

Printed on recycled paper.

1475AS–IMAGE–06/02 xM