adStar

High-Performance 32-bit Microcontroller

with 512KB Flash and 8 or 16MB SDRAM

advanced digital chips inc.

Description

adStar is designed to provide a cost effective and high performance microcontroller solution as LCD display applications, and general application. adStar integrated microprocessor combines a 32-bit advanced EISC processor core and SDRAM with several peripheral functions such as timer, serial Interface, USB, flash memory controller, etc. The on-chip cache and SRAM provide one-cycle access to code and data to speed program execution.

Features

High Performance Processor Core
- 32-bit EISC CPU Core
- Harvard Architecture
- 5-Stage Pipelining
- 1-Cycle 32-bit MAC
- 8K-Bytes 2Way Instruction Cache
- 8K-Bytes 2Way Data Cache
- JTAG Debugger : Core & Bus Debugger
- Up to 108MIPS throughput with 108MHz Clock

Additional Embedded Memory
- 32K-Bytes SRAM (30K-Bytes Data/2K-Bytes Instruction)
- 8 or 16M-Bytes SDRAM
- Optional 512K-Bytes Flash

External Memory Interface
- 8 or 16-bit Data, up to 18-bit Addressing
- Supports SRAM or NOR Flash

NAND Flash Interface
- Supports SLC and MLC (4 or 24-bit ECC) Type

Boot Mode
- ROM Booting Mode
- NAND Booting Mode
- Flash Booting Mode

JTAG Interface
- Boundary-scan Capabilities
- Extensive On-chip Debug Support
- Programming of OTP through the JTAG Interface

LCD Controller
- RGB 888 or 565 Output
- Supports up to 800x600 Resolution Display Mode

USB Full-Speed Device/Host(*TBD) **Compatible**
- Supports Full-speed Data Rate 12Mbps

Copy Protection
- 24-bit Key-protected One Programmable Bits

SD-Card Interface
- Supports Single/Quad

Sound Mixer
- 2-ch. I^2S
- 2-ch. Digital Modulator

Other Peripheral Functions
- 4-ch. 16-bit Timer/PWM/Capture
- 32-bit Watchdog Timer
- Interrupt Controller
- 1-ch. PWM
- 5-ch. UART (1-ch. with IrDA support)
- 2-ch. Master/Slave SPI
- TWI (Two Wired Interface)
- 75 or 69 Port I/O (muxed with other interfaces)

Analog Functions
- POR (Power On Reset)
- BOD (Brown Out Detector)
- LDO Regulator
- PLL0(for system), PLL1(for LCD)
- 1MSPS 4-ch. Input 10-bit ADC

Operating Voltage : 3.0V to 3.6V

Package
- 128-Pin ETQFP (14 x 14)

Software Library
- JPEG Software Decoding
- MP3 Software Decoding

*Notice. TBD means "To be determined"

Product Matrix

Product Code	SDRAM	FLASH
adStar-D8M	8MB	-
adStar-D8MF512	8MB	512KB
adStar-D16M	16MB	-
adStar-D16MF512	16MB	512KB

Application Area

- LCD Display Applications
- Smart Home Appliance (Refrigerator, Washing Machine, Air Conditioner, Rice Cooker, etc.)
- POS System - Sign-Pad - POP Monitor - Industrial Controller - Access Controller

EISC

New Embedded Microprocessor

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Instruction Highlights

What is EISC ISA?
Adchips' patented EISC (Extendable instruction Set Computer) ISA is a compress RISC typed instruction set that can reduce the program size and the frequency of the memory access efficiently for optimizing energy consumption.

AE32000C ISA
AE32000 stands for 32-bit advanced EISC ISA family. In the revision C, various SIMD-typed DSP instructions are added for accelerating DSP instructions are added for accelerating DSP applications.

32bit Data Processing
AE32000C processors have 32-bit data processing units such as 32-bit ALU, barrel shifter, multiplier and MAC (multiply and accumulator) and so on.

4GB Memory Space
AE32000C processors can access up to 4G-byte memory space.

Various Cond. Branches
14 type conditional branches bring more compactor control sequences and less energy consumption.

Multiple PUSH/POP
AE32000C processor support multiple PUSH and POP instruction for efficient context switching.

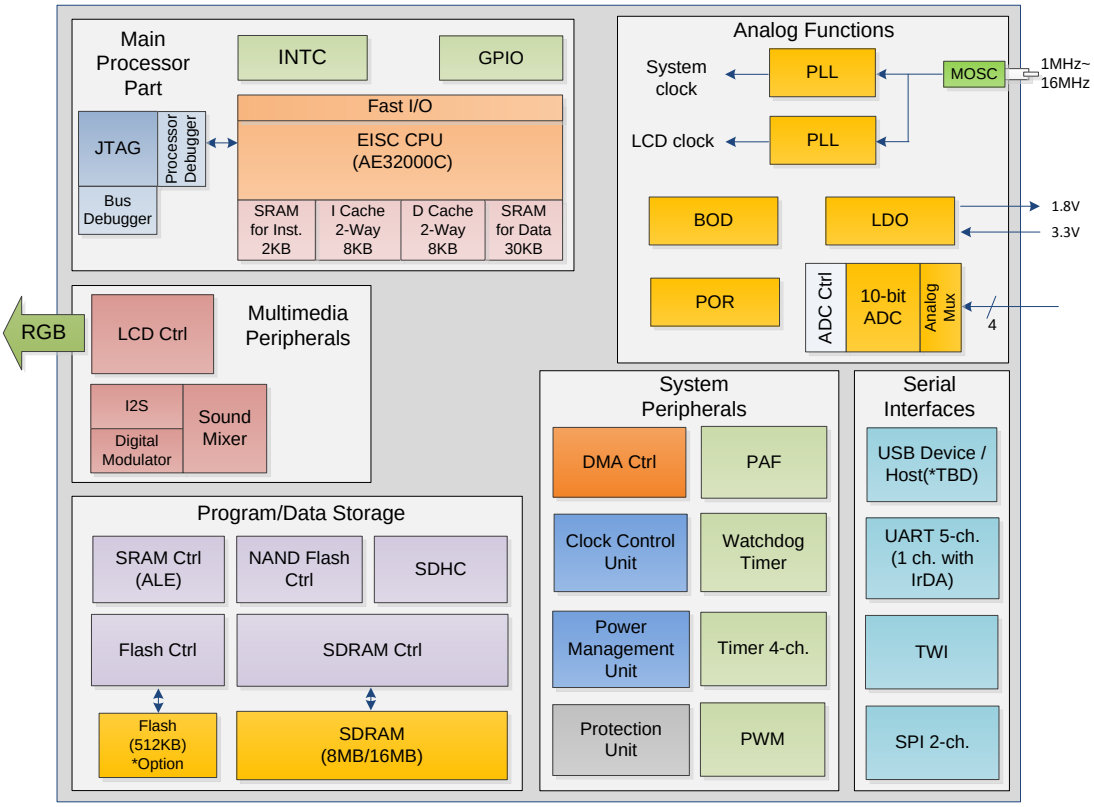
3 Processing Mode
AE32000C supports supervisor mode, user mode and hypervisor mode for advanced resource protection.

SIMD-DSP Extension
AE32000C supports SIMD-DSP instructions such as 32-bit MAC with 80-bit accumulator, 8-bit and 16-bit SIMD MAC, sum-of-products operation, saturated add/subtract, min/max, average and so on.

Rich Registers
16 x 32-bit GPRs
9 x 32-bit SPRs
3 Stack Pointers

Why EISC?
EISC offers energy efficiency for Your SoC in any applications

Block Diagram



Development Board

Features

- JTAG Debugger
- 1-ch. UART D-Sub Connector
- 1-ch. UART (RS-232 or TTL Level Selectable)
- 1-ch. Digital Audio PWM
- PWM Buzzer
- 1G-bit NAND Flash Memory
- SD-Card Socket
- 32K-bit Serial Flash Memory (TWI I/F)
- Real-Time Clock & Back-up Battery
- Microphone & Thermistor
- Extension ADC Input
- 7" TFT-LCD (800 X 480) with Touch Panel
- Extension TFT-LCD Connector
- USB Host(*TBD) & Device
- Wi-Fi Module (IEEE802.11b/g)
- PCB through hole for component test (13X16, 7X3, 2.54mm)

* Notice. TBD means "To be determined"

EISC Studio Software Tool

EISC-Studio is an integrated development environment tool for the developers who are using EISC CPU in Windows environment. EISC-Studio provides convenient source editor, compile and debug tools while user implements a system and also, various images of high level programming language and executable code for source level debugging.