32bit Flash-based EISC Microcontroller

CANTUS

Description

CANTUS is a single chip, low power MP3 Decoder that decodes MP3 digital audio data including voice compression and decompression for voice recorder. CANTUS is fully integrated analog/digital peripherals, MCU, memories, USB and Audio Interface. With on-chip Power On Reset, Timer, UART, and Voice Codec. CANTUS is truly System on-a-Chip solution. The ISP allows the program memory to be Re-programmed in-system through an SPI/JTAG interface, by a conventional nonvolatile memory programmer, or by an on-chip boot program running on the MCU core. CANTUS is a powerful microcontroller that provides a highly flexible and cost effective solution to many embedded control applications. Refer to table for specific product feature selection.

Features

High Performance Processor Core
- 32bit EISC Core MCU
- 5-Stage Pipelining
- 16 General Purpose Registers
- 8 Special Purpose Registers
- 1 Cycle 32bit Multiplier
- 8KBytes I-Cache, 4KBytes D-Cache
- JTAG Debugger
- Up to 96MIPS throughput with 96MHz Clock

Memory
- 128Kbytes/512Kbytes Internal NOR Flash Memory
  - √ Endurance : 10,000 Write/Erase Cycles
  - √ SPI interface for ISP/JTAG
- 80KBytes Internal SRAM
- External SRAM Interface (supports 4bank, 512KB/bank)
- NAND Flash Interface (supports SLC NAND booting)
  - Supports SLC and MLC type

USB V 1.1 FS Device Compatible
- Supports Full-speed Data Rate 12Mbps
- 5 endpoints (Control, 2 Interrupt In/Out, 2 Bulk In/Out)
  - 16 Bytes for Control / Interrupt
  - 64 Bytes for Bulk

MP3 software decoder and Hardware IMA-ADPCM
- MP3/OGG Software Decoding
- IMA-ADPCM Encoding / Decoding
- Supports 8/16-bit Stereo PCM Data
- I2S Interface and Embedded 14-bit Voice Codec

Peripheral Functions
- 8 ch. 32bit Timer with 10bit pre-scaler
  - Timer/Counter, PWM
  - Capture, Output Compare
- 32bit Watchdog Timer
- 8 ch. UART
- 1 ch. Master/Slave SPI
- 1 ch.Two-wire Serial Interface
- 2 ch. GDMA
- 14-bit Voice Codec with Analog mux
- 48 Port I/O
- 4x4 Key Scan
- LDO 100mA
- LDO 50mA
- Power management unit
- RTC
- POR
- PLL

Process
- Low Power 0.18um Process

Package
- 100 pin TQFP

Part Number
- CANTUS128 : 128Kbytes Internal NOR Flash Memory
- CANTUS512 : 512Kbytes Internal NOR Flash Memory

Applications

Audio
- MP3 Application
- Language Teaching Machine
- Voice Recorder
- Announcement Device

Automotive Infotainment
- GPS/Radar/Camera Detector

Home Appliance
- Robot Vacuum Cleaner
- Rice Cooker

Toy
- Toy Robot
- Story Book

Industrial
- Controller

Security
- Door Lock (Fingerprint Biometrics)
- Access Controller

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Instruction Highlights

What is EISC ISA?
ADChips's 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 32bit ALU, barrel Shifter, multiplier and MAC (Multiply and accumulator) And so on.

4G memory space
AE32000C processors can access up to 4G 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 32bit MAC With 80bit accumulator, 8bit and 16bit SIMD MAC, Sum-of-Products Operation, Saturated Add/Subtract, Min/max, Average and so on.

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

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

Block Diagram

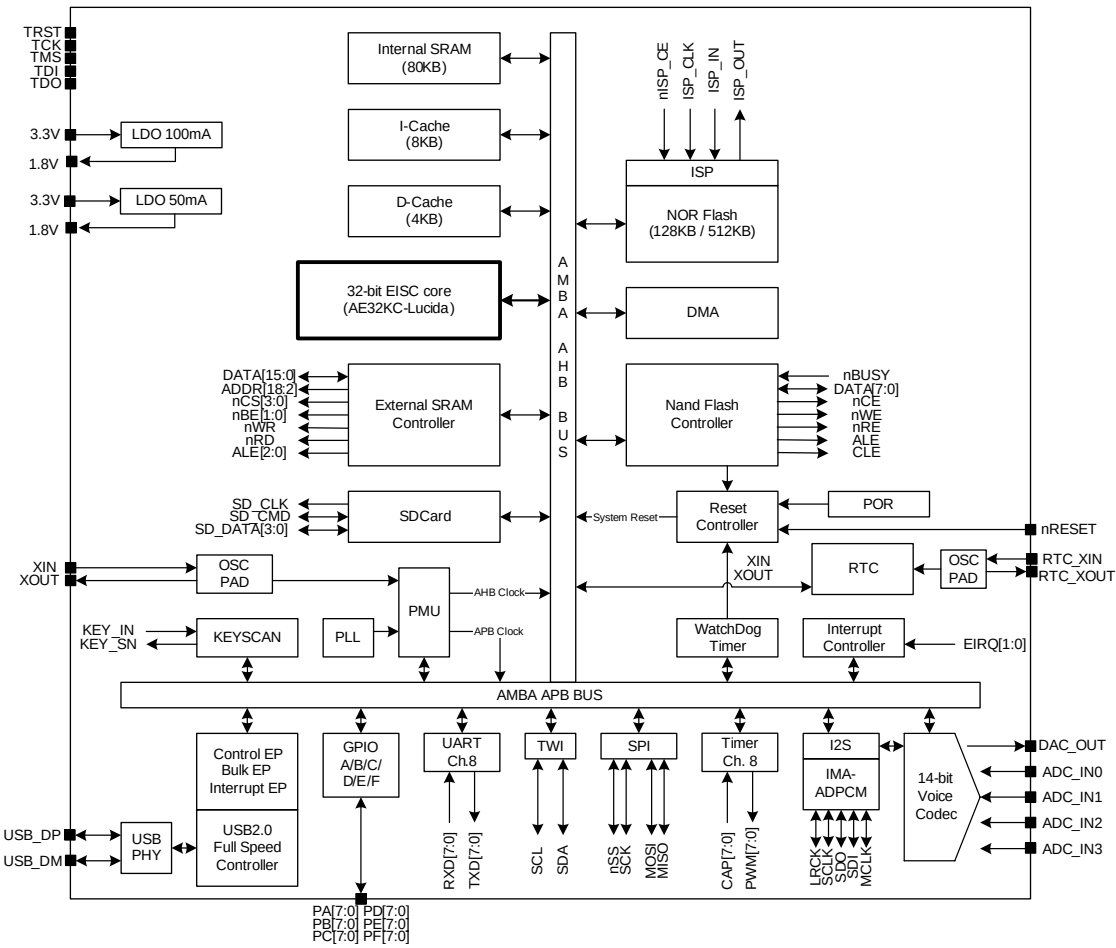

Table. Product Selection Guide

	CPU Speed(MHz)	Flash Memory	Internal SRAM(KB)	External SRAM	NandFlash Ctrl	ADPCM	SDCard	USB 1.1 Device	UART	TWI	SPI	Watchdog Timer	Timer / PWM	RTC	ADC / DAC (Codec)	GPIO	Package
TG471	33	O	8	X	Δ	O	X	O	Ch.4	O	O	O	Ch.8	X	O	35	64LQFP
CANTUS	96	O	80	O	O	O	O	O	Ch.8	O	O	O	Ch.8	O	O	48	100TQFP

Notice : Δ Available by software

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