Peak Microtech
芯普电子

# EAGLE

## High-Performance Multimedia Processor

*32-bit EISC Microcontroller*

**Preliminary Information**

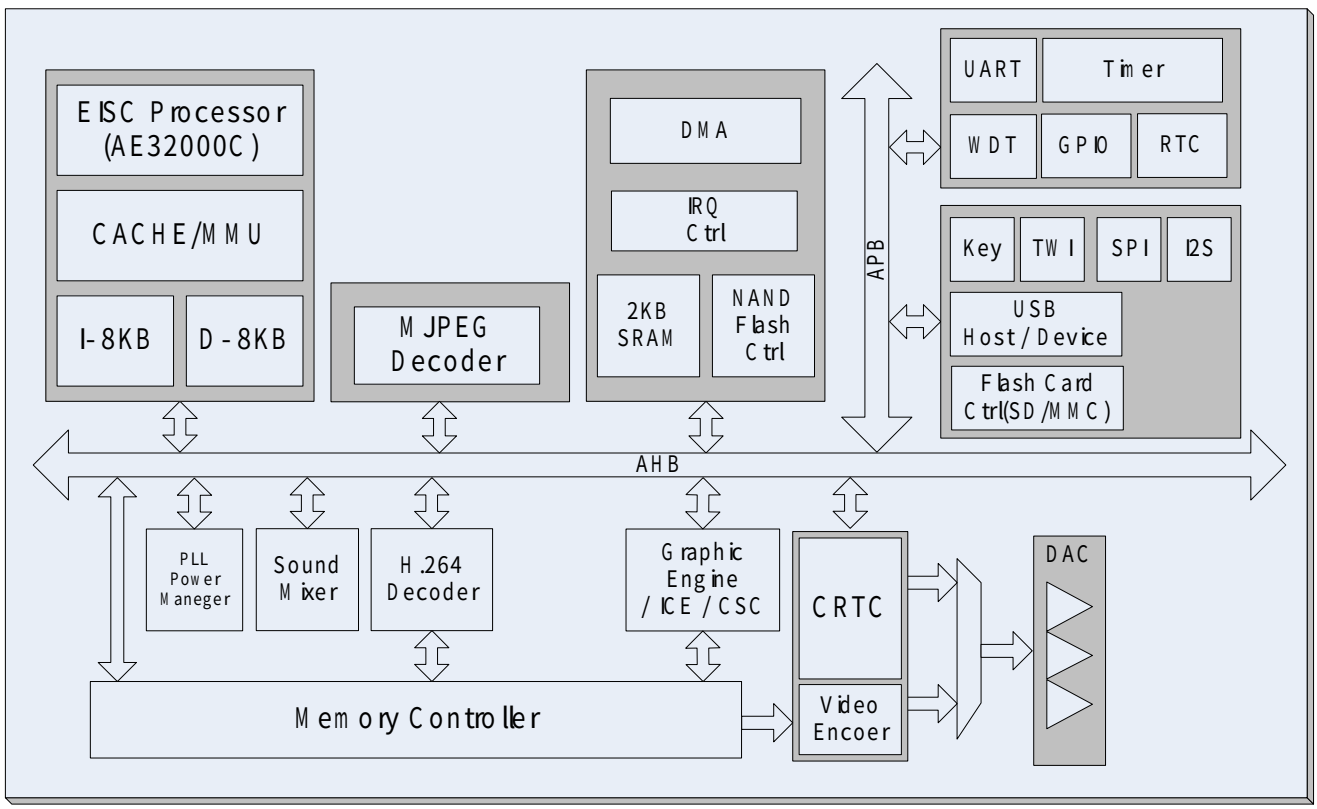
***Description***

EAGLE is the first chip of Peaks' multimedia processor. EAGLE is a super integrated SoC (System On a Chip) aimed at providing high performance multimedia functionality and low power consumption for Personal Multimedia Digital Assistance.

EAGLE incorporated 32bit CPU processor with integrated DSP support, H.264 Decoder, JPEG Decoder ,2D Graphic engine, Sound Mixer, CRT controller with OSD, Video Encoder, Video Decoder Interface Module, USB Host/Device and I/O peripheral components. EAGLE can reduce system cost significantly through eliminating not only system control CPU, but also graphic IC, Sound IC and Video Encoder as well as USB. EAGLE helps system designer reduce its engineering effort and time in developing a new system by adding only memory and I/O devices such as LCD panel, Flash and etc.

Therefore EAGLE is the best solution for multimedia player, portable karaoke, portable and arcade game and etc.

## EAGLE BLOCK DIAGRAM




EISC

# EAGLE

## *High-Performance Multimedia Processor*

*32-bit EISC Microcontroller*

# Preliminary Information

### *Features*

**32bit EISC(AE32000C) Processor Core**
-Based On EISC Instruction Set Architecture.
-High Performance Integer Processing Core with DSP Capabilities
-5-Stage Pipelining, Harvard Architecture, 16 General Purpose Registers (GPR) and 9 Special Purpose Registers (SPR)
-Supports AMBA 2.0 – AHB Master
**On-Chip Cache Controller**
Separated On-Chip Instruction/Data Cache
4-way Set Associative, 8KByte Instruction Cache, 8KByte Data Cache
On-Chip Memory Management Unit
Memory Protection Capabilities Based on Memory Bank and Sub-banking Scheme
Separated On-Chip Instruction/Data TLB, 4-Way Set Associative, 128-Entry
**DSP function**
Saturated Add, Average, Sum of Product, Pack
Shift/Rotate, ABS, Min/Max
Address Unit – Next Address, Reverse Address, Auto address
32 bit signed/unsigned multiply
32 bit signed multiply and accumulate
**CRT Controller**
-Supports VGA, TFT LCD and NTSC / PAL Display Monitor
-Supports display resolution up to 1024 x 768
-Support VESA DPMS for VGA monitor
-Horizontal and Vertical double scan control
-Serialization RGB data and 256 x 32 FIFO controls in CRTC block
-Gun Interface
**Video Signal Processing**
-Support External Video Sync. Dependent / Independent Mode
-Supports Internal Video Display Mode(Local Mode) and External Video & Overlay Mode(Remote Mode)
-Supports External Sync. Detection
**Video Encoder**
-Supports CVBS Analog Output for TV
-Supports NTSC/PAL Display Mode
-Supports Brightness, Contrast, Saturation, HUE Control
**Graphic Engine**
-Designed Based on OpenGL's Double buffer Architecture.
-Supports 16 / 8 / 4 bit color mode.
-Supports Tile Addressing / Font Addressing modes
-Supports Texture Mapping ( Zoom In / Out, Rotate, Iteration, Clipping )
-Supports Shading/ Alpha Blending / Transparency / Dithering ( 2X2, 4X4 )
-Supports Mosaic Mode
-Supports Non-Texture Memory Mode.
**Video Decoder Interface Module(Including CSC Image Capturer)**
-Supports Data Input Format 4:2:2, 8bit YCbCr
-Supports Interlace / Non-interlace Mode
-Color Space Conversion
-R/G/B Gain Control
-X/Y Down Scaling Mode & Display Position Control
**Local Memory Controller**
-Local / Frame Shared Memory (Local / Frame / Texture @ Non-texture memory mode)
-64Mbyte Address Space per each Bank
-Support 7 Memory Banks
-Supports External Wait Signal to Expand The Bus Cycle
-Supports Self-refresh Mode in SDRAM for Power-down
-Supports SDRAM and Asynchronous type devices.
-Supports SDRAM of Full Page Mode
-8/16/32 Bit Memory Interface
-Includes direct write FIFO to enable fast burst mode write to frame buffer by the CPU
**Texture Memory Controller**
-Max 128Mbyte Address Space
-8/16 Bit Memory Interface
-Supports SDRAM of Full Page Mode
**H.264 Decoder & Scaler**
-H.264/AVC Baseline Compatible
-CIF 30 frame/sec @ 27MHz
-Supports decoding of YCbCr (4:2:0) format video
-Supports Scaling up to 800x480
**JPEG Decoder**
-ISO 10918-2 Base line JPEG Decoder
-Only Support Typical Huffman Table defined in annex K of Standard.
-Support YCbCr 4:2:2 / 4:2:0 Format
-Maximum Resolution:1024x768
-Only Support multiple of 32 image width
-Only Support multiple of 8 image height on 4:2:2 Image Format
-Only Support multiple of 16 image height on 4:2:0 Image Format
**Sound Mixer**
-Maximum 8 Channel
-Sampling Rage 0.172kHz ~ 44.1kHz
-Supports 4-ADPCM, 8/16-bit PCM
-Supports Volume and Left/Right Balance Control
-Output in Stereo 16-bit MSB(Left)-justified format
-I2S Audio Codec I/F (MCLK-384fs, SCLK-32fs)
**SD Card Controller**
-Support SD Memory Card (ver 1.1) / MMC (ver 3.31) compatible
-Support High Speed (50 MHz)
-Support 1bit / 4bit data bus
-Support DMA data transfer
**Peripheral functions**
-2 Ch. GDMA
-I2S with ADPCM
-Key Scan (Max. 5 x 5)
-Programmable Priority Interrupt controller
-Watch dog Timer
-4 Ch. UART with 16 * 8 bit FIFO
-USB 1.1 Host/Device Controller ( supports only full speed(12Mbs) )
-GPIO
-4 Ch. Timer ( All Ch. are available for PWM/Capture ).
-Nand Flash Controller ( supports Auto boot mode )
-TWI
-RTC
-SPI
**Clock & Power Manager**
-On-chip SPLL, UPLL and CPLL
CPLL generates the clock to operate CRT.
UPLL generates the clock to operate USB Host/Device.
SPLL generates the clock to operate EAGLE.
-The clocks to each blocks can be selected by software.
-Power mode : Normal and Slow
Normal mode : Normal operating mode
Slow mode : Low frequency clock without PLL
**Integration**
-Internal SRAM 2KB
-Embedded Triple DAC
-Embedded PLL ( SPLL, UPLL, CPLL )
-JTAG (Boundary Scan Test)
-Supports Memory BIST
-Full Scan Process
-0.18um Standard CMOS Process
-1.8V Core Voltage and 3.3V I/O Voltage Operation
-256 LQFP/BGA

### *Application Areas*

Car consumer products, Game Machine, Home Automation, Karaoke System, Display Panel etc.

### For more information

Beijing Peak Microtech Co.,Ltd. Rm A606,Eagle Run Plaza,No.26,Xiao Yun Rd.,Chaoyang Dist., Beijing, China(postcode: 100016)
Tel : +86-10-51088120/1 Fax : +86-10-5108-8122
http://www.peaktech.com.cn E-mail : sales@peaktech.com.cn