



GMX-1000

High Performance Video Processor

**GMX-1000
High Performance Video Processor
Data Book**

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1 DESCRIPTIONS AND FEATURES

1.1 General Description

ADC's GMX-1000 32bit EISC microcontroller is designed to provide a cost-effective and high performance microcontroller solution for Multimedia using Graphic Engine and Sound Engine. The GMX-1000 integrated microprocessor combines a 32bit EISC(AE32000C) processor core with several peripheral functions such as timer, serial interface and etc. To speed program execution, the on-chip cache SRAM provides one-cycle access to code and data. GMX-1000 supports video format for NTSC/PAL display monitor, it can be in local mode only for internal video image and remote mode for external video signal overlay.

AE32000C is the family in EISC series and is optimized for Embedded Application and the general purpose 32bit and high-performance microprocessor. For all of this, EISC makes code-density higher as taking the excellence of CISC and employs Simple Instruction Set to simplify hardware.

GMX-1000 can provide the cost-effective and high performance system solution such as karaoke, video editor, photo sticker and etc.

1.2 Features

Built in 32bit CPU, Cache

- High Performance EISC Core AE32000C
- 4 Way Set Associative Harvard Cache with 8Kbyte Instruction and 8Kbyte Data Cache.
- Pseudo-LRU (Least Recently Used) Replace Algorithm.
- Write Through / Write Back Policy.

CRT Controller

- Support TFT LCD and NTSC / PAL(B,D,G,H,I,N,M, Comb-N) Display Monitor
- Supports display resolution up to 1024 x 1024
- Support VESA DPMS for VGA monitor
- Double buffer ping-pong controls
- Horizontal and Vertical double scan control
- Serialization RGB data and 32 x 16 FIFO controls in CRTC block
- Supports Gun Interface

Video Signal Processing

- Support Internal Video Display Mode(Local Mode) and External Video & Overlay Mode(Remote Mode)
- Supports External Sync Detection

Graphic Engine

- Designed Based on OpenGL's Double buffer Architecture.
- Supports 16/8/4 bit color mode. (Internally 24bpp processing)
- Supports Tile Addressing / Font Addressing modes
- Texture Mapping (Zoom In / Out, Rotate, Iteration, Clipping)
- Shading/ Alpha Blending / Transparency / Dithering (2X2, 4X4)
- Supports Non-Texture Memory Mode.

Video Decoder Interface Module

- Supports Interace Mode.
- Color Space Conversion.
- R/G/B Gain Control.
- X/Y Down Scaling Mode & Display Position Control

Local Memory

- Local / Frame Shared Memory
- 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
- Support SDRAM and SRAM

- 8/16bit memory bus
- Includes direct write FIFO to enable fast burst mode write to frame buffer by the CPU
- Nand Flash Controller & Nand Flash DMA & Boot Loader

Texture Memory

- Max 64Mbyte Address Space
- Support SDRAM
- 16bit fixed memory bus

Peripheral functions

- 2 Ch. GDMA
- IIS
- Key Scan (Max. 5 x 5)
- Programmable Priority Interrupt controller
- 4 Ch. 16 bit Counter for timer
- Watch dog Timer
- 4 Ch. UART with 16 * 8 bit FIFO
- USB
- GPIO
- 2 Ch. PWM or Timer
- 1 Ch. PPM
- Voice Recorder Controller

Integration

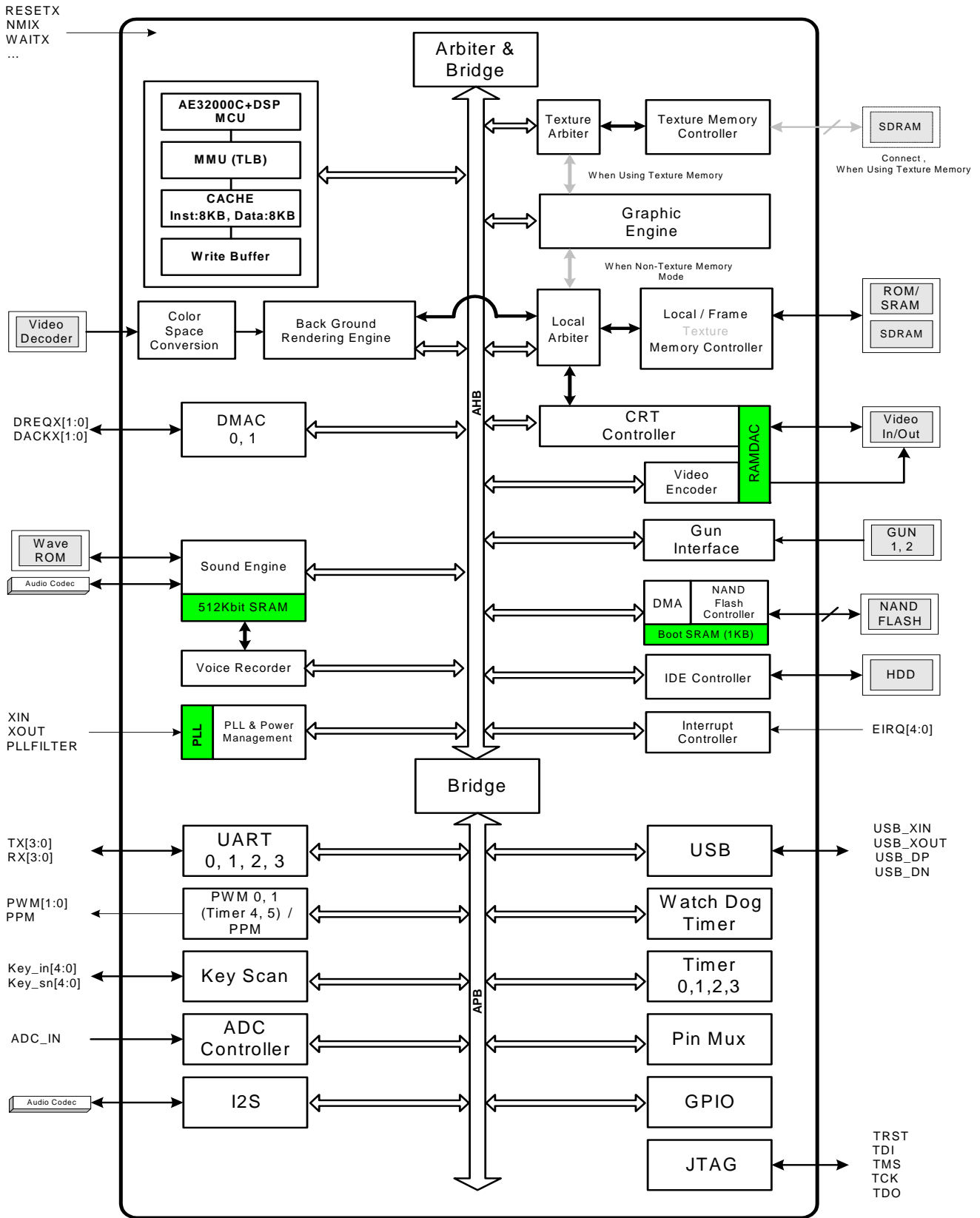
- Embedded 4 Ch. ADC
- Embedded 4 Ch. DAC
- Embedded PLL
- JTAG (Boundary Scan Test)
- Supports Memory BIST
- Full Scan

Process

- 0.18um Standard CMOS Process
- 1.8V Core Voltage and 3.3V I/O Voltage Operation
- 272 FBGA

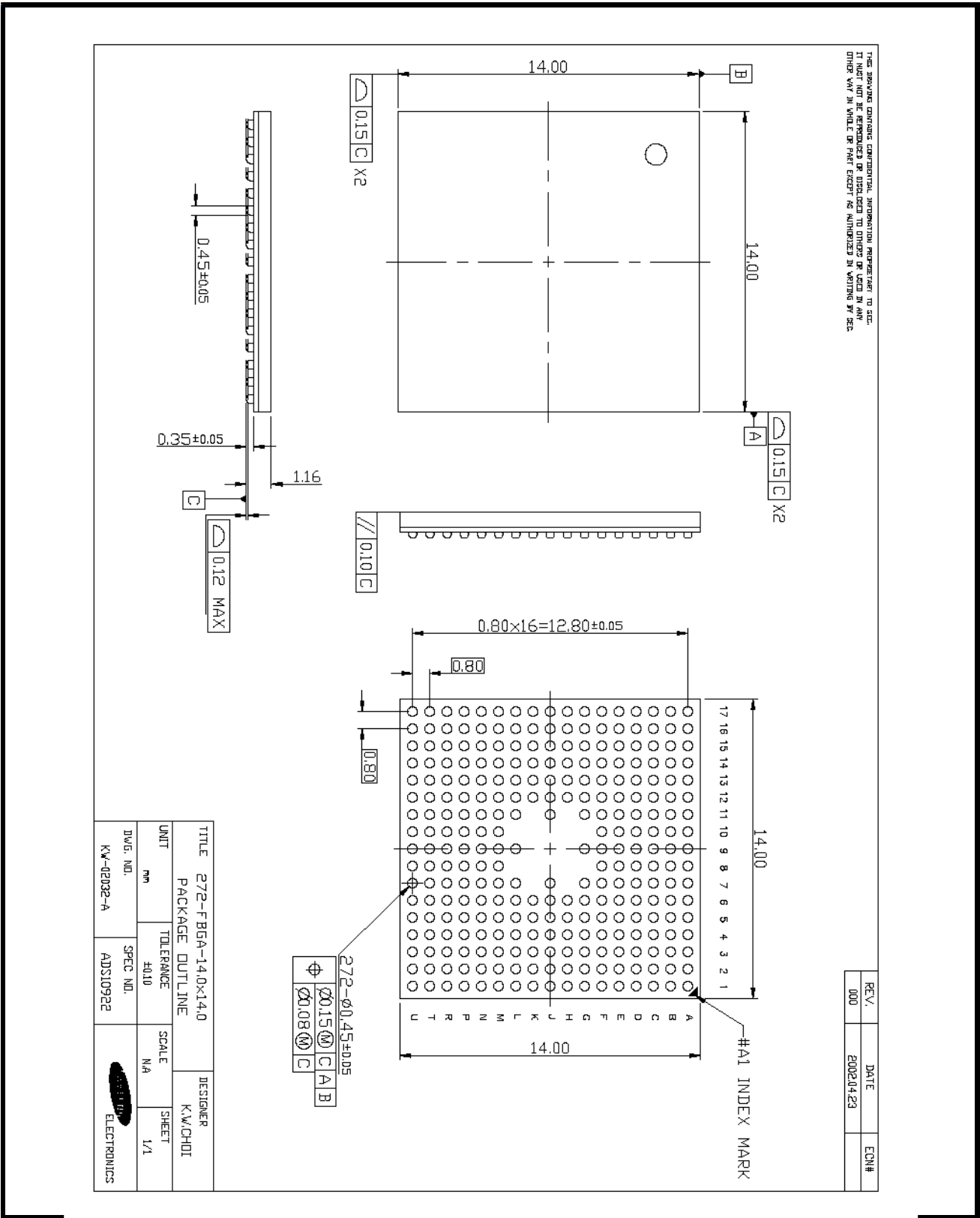
2 BLOCK DIAGRAM & PIN DESCRIPTION

2.1 Block Diagram



Picture 2-1 Top Block Diagram

2.2 Package Dimension



Picture 2.2 Package Dimension