Actions

MICROELECTRONICS Co., Ltd.

Actions-micro AM8268N Datasheet

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Revision History

Version	Date	Description	Author
1.0	06/27/2018	Initial Create	maweishuo

1 Introduction

1.1 Overview

The AM8268N processor from Actions-Micro is a highly integrated mix signal SoC target at multi-media applications. The AM8268N emmedded CPU is a high performance, low power 32bit RISC core with DSP instruction extension, which can run as fast as 800MHz.

The AM8268N processor features a hardwired multi-format video decoder, which supports a large variety of popular video formats including: H.264, RMVB, MPEG1/2/4 and VC1 at full HD resolution. The AM8268N integrated image/video post processor and display engine provide a powerful image processing ability, such as seamless zoom in/zoom out, cropping, rotation, color space conversion, gamma correction, edge enhancement, dithering, brightness, contrast and saturation adjustment. Moreover, a configurable FIR is reserved for other special effects extension. The 2 layers of OSD window can be configured as large as full screen and the color depth is ranging from 1 bit to 32bit true color.

The AM8268N multi-media processor provided display solutions: with the help of on chip HDMI.

AM8268N is also integrated with a DDR2/DDR3 SDRAM controller, 1 USB OTG controllers, UART, I2C, SPI,etc.

There is a 512Mb DDR2 memory die integrated in AM8268N, so no need to hang a DDR2 memory on PCB.

2 Feature

The AM8268N provides high level of system integration to support a wide variety of applications. The features of the AM8268N include:

✓ **32BIT RISC CORE**
- 32K byte instruction cache and data cache
- F/W can program from DC up to 800MHz transparently
- DSP instruction for multi-media acceleration
- Static design allows changing clock at run-time for power saving

✓ **VIDEO DECODER**
- Multi-format supported including:

H.264 profile and level	Up to High Profile ,levels 1-4.1
MPEG-4 visual profile and level	Advanced Simple profile(frame picture) , levels 0-5
H.263 profile and level	Profile 0, levels 10-70. Image size up to 720x576, time code extensions not supported
VC-1 profile and level	Simple and Main profile; low, medium and high levels
MPEG-2/MPEG-1	Main profile; low and main levels, MPEG-1 D-picture not support
RV8/9/10	

- 30 frames per second at 1920x1080 resolution for all format
- Adaptive De-interlacing

✓ **JPEG DECODER**
- Support JPEG baseline
- Support YCbCr 4:2:0 planar and semiplanar
- Support YCbYCr & CbYCrY 4:2:2 interleaved
- Support image size: from 80x16 to 4672x3504
- Support rotate: +90° , -90°

✓ **IMAGE/VIDEO POST PROCESSOR**
- Image up/down scaling at arbitrary non-integer scaling ratio
- Separate scaling ratio for horizontal and vertical dimensions
- Image cropping
- Image crossing

- Image rotation, 90 180 and 270 degrees and horizontal/vertical flip
- Image mask, output image writing can be prevented on two rectangular areas
- Support YUV444/YUV422/RGB888/RGB565 for mask window for alpha blending(256 level)
- YUV/RGB conversion
- Maximum output image size up to 1920x1080

✓ **Display Engine**
- YCbCr/RGB conversion, user definable conversion coefficients
- Image up scaling at arbitrary non-integer scaling ratio
- Separate scaling ratio for horizontal and vertical dimensions
- brightness, contrast and saturation adjust
- Edge enhancement
- Dynamic contrast adjust
- Direct mapped Gamma correction for RGB channel separately
- 24bit to 16/18 bit Bayer pattern/1D/2D method dithering
- Support progressive and interlace input format
- Support YUV4:2:2(interleave), YUV4:2:0(semi planar), RGB565, RGB888 input forma
- 16x16 hardware cursor

✓ **OSD**
- Two layers of OSD window with overlap
- 8 level alpha blending for each window
- 1,2,4 or 8 bits OSD bitmap data width
- Transparency pixels allowed in OSD window
- Two configurable OSD palettes
- Each one of the 2 OSD windows can fetch RGB565/ARGB8888 data from system memory directly

✓ **DISPLAY INTERFACE**
- HDMI Tx support, industry standard compliance HDMI 1.2
- Support output size up to 1920x1080
- Configurable horizontal sync interrupt

✓ **AUDIO**
- Multi-format audio decoder:MP1/MP2/MP3/WMA/AAC/AMR-NB/WAV/PCM/ADPCM
- Build in Stereo 18-bit Sigma-Delta DAC: SNR>92db(no a-weight), 18bits,sample rate 8/12/11.05/16/22/24/32/44.1/48
- Support 32 levels volume control

✓ **MEMORY CONTROLLER**
- Integrated with a 512Mb DDR2 die which is up to 1066Mbps
- OTP ROM 64bit Chip ID

✓ **DMA CONTROLLER**
- 8 physical channels and 4 bus channels
- Stride mode support
- Software configurable priority

✓ **Boot ROM**
- On chip boot ROM with boot loader
- The system could be loaded from SPI Nor flash

✓ **USB 2.0 OTG**
- Complies with Universal Serial Bus Specification. Revision 2.0.
- Complies with On-The-Go Supplement to the USB2.0 Specification Revision 1.0a.
- Supports point-to-point communication with one low-speed, full-speed or high-speed device in Host mode.
- Supports full-speed or high-speed in peripheral mode.
- Supports USB Mass Storage Class Bulk-Only Transport Revision 1.0 as host or device.
- Supports Electronic still picture imaging Picture Transfer Protocol (PTP)
- Supports direct print function using pict-bridge
- Supports Universal Serial Bus Device Class Definition for Printing Devices Version 1.1 as host
- Supports Universal Serial Bus Still Image Capture Device Definition Revision 1.0 as host
- Configurable/programmable size of endpoints.
- Configurable/programmable single, double, triple or quad buffering.
- Programmable type of endpoints.
- Supports high-speed high-bandwidth Isochronous and Interrupt transfer.
- Supports suspend, resume and power managements function.
- Support USB wakeup

✓ **OTHER INTERFACE**
- UART/I2C/SPI
- 3 external interrupts
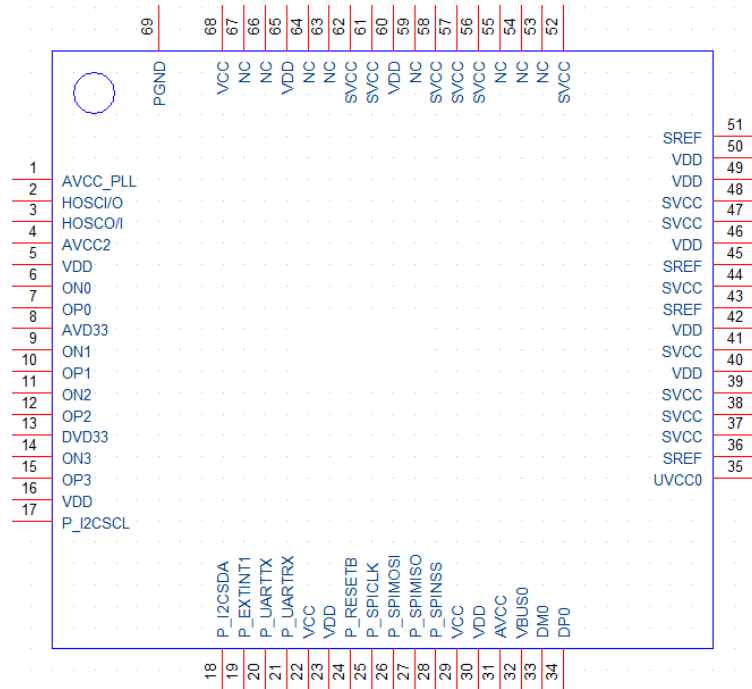- 41 configurable GPIO shared with function pins

✓ **POWER**
- 1.3v for core

- 3.3v/1.8v for IO
- Build in 1.5v bandgap reference
- Core PLL, LCD PLL,Audio PLL and DDR PLL support spread spectrum

✓ **PACKAGE**
   - QFN 68(epad)

5.2 Pin out diagram

AM8268N PIN-OUT DIAGRAM