STV0986

5 Megapixel mobile imaging processor

Data Brief

Features

- Supports 2 mutually exclusive SMIA profile 2 compliant sensors of up to 5 Megapixel resolution[a]
- Interfaces
  - Sensor interface: 2 x SMIA CCP Class 2[b] receivers (640Mbit/s)
  - Host interface: SMIA CCP Class 1[b] transmitter (416Mbit/s) or ITU (8-bit CCIR interface, up to 80MHz)
  - Control interface: I²C (400kHz)
- Enhanced video processor
  - Noise and defect filtering, color reconstruction, sharpness enhancement, 4-channel lens shading correction and barrel distortion correction
  - Statistic processor for automatic exposure, automatic white balance and auto-focus control
  - General purpose input/outputs (GPIOs) for controlling external actuators
- 2 video pipes for full frame-rate concurrent viewfinder and video/still capture. Single shot (e.g. flashgun) thumbnail generation
  - Gamma correction programmable for both CRT and LCD displays
  - Color correction matrix
  - Digital zoom: Smooth 16X downscale capability with up-scale capability to 4X
- Output formats: JPEG, YUV4:2:2, YUV4:2:0, Planar YUV4:2:0 (up to CIF), RGB888, RGB565, RGB444
- 4:2:0 JPEG compression with programmable quantization matrix and target file size
- JPEG operations up to 30 fps at 2 Megapixel resolution, up to 20 fps at 3 Megapixel resolution, and up to 12.5 fps at 5 Megapixel resolution
- Interleaved video modes (concurrent viewfinder and video/still capture)
  - 'Alternate frame' mode up to 15 fps
  - 'Single frame' mode up to 30 fps
- Image rotation/mirroring/flip support for viewfinder (up to CIF)
- Independent host interface transmitter clock, generated by an embedded PLL - frequency selectable by host
- Synchronised flash gun control with red-eye reduction (pre-flash and main-flash strobes for high-power LED or Xenon strobe control)
- Enhanced multi-zone auto-focus (supporting up to 9 zones with programmable weighting)

Description

The STV0986 is an ultra low power megapixel digital image processor designed to fit into mobile applications. The STV0986 contains advanced image correction, noise reduction techniques and a smooth digital zoom facility, resulting in exceptional image quality in today's multi-megapixel images. The STV0986 supports 2 SMIA sensors, flashgun (LED or Xenon), auto-focus and programmable general purpose IOs for additional external actuators. The internal buffer and versatile clock manager within the STV0986 accommodates a wide range of data-rates between the sensors, the STV0986 and the host.

Applications

- Mobile phone
- PDA
- Wireless security camera

a. SMIA 1.0 functional specification version 1.0 http://www.smia-forum.org/

b. SMIA 1.0 CCP2 Specification version 1.0

Technical specifications

Table 1. Technical specifications

Technology	90nm CMOS
Sensor	SMIA compliant sensors up to 5 Megapixels.
Frame rate	Up to 30fps: – @ 2MP JPEG + CIF RGB565 – @ VGA YUV422 – @ CIF RGB888 + QCIF YUV422 Up to 20fps @ 3MP JPEG + CIF RGB565 Up to 12.5fps – @ 5MP JPEG + CIF RGB565l
Still digital zoom	16X downscale from full input resolution and up to 4X upscale
Video/Viewfinder digital zoom	16X downscale from full input resolution and up to 4X upscale, with smooth zoom effect in x0.001 steps
Power supplies	2.8V or 1.8V +/- 5% (I/O ring) 1.8V +/- 5% (CCP interfaces and PLL) 1.2V +/- 5% (core logic), or 1.2V generated by the internal regulator from the 1.8V supply
Power requirements (typical)	3MP JPEG + QVGA RGB565 @ 20fps: – 165 mA @ 1.2V and 15 mA @ 1.8V for external 1.2V supply – 185mA @ 1.8V if using internal regulator Viewfinder QVGA RGB565 @ 20fps: – 45 mA @ 1.2V and 15 mA @ 1.8V for external 1.2V supply – 65mA @ 1.8V if using internal regulator Standby < 100µW
Package	Rohs compliant (Leadfree) – TFBGA 84 balls 6 x 6 x 1.2 mm, pin compatible with STV0984

Table 2. Temperature ranges

Storage	-40 to +150 °C
Operating	-25 to +70 °C

Figure 1. Application diagram

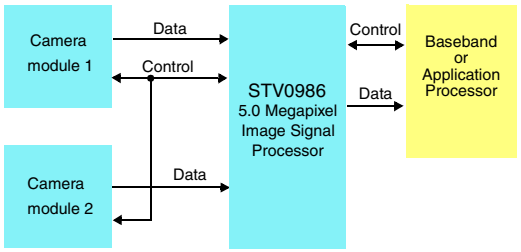
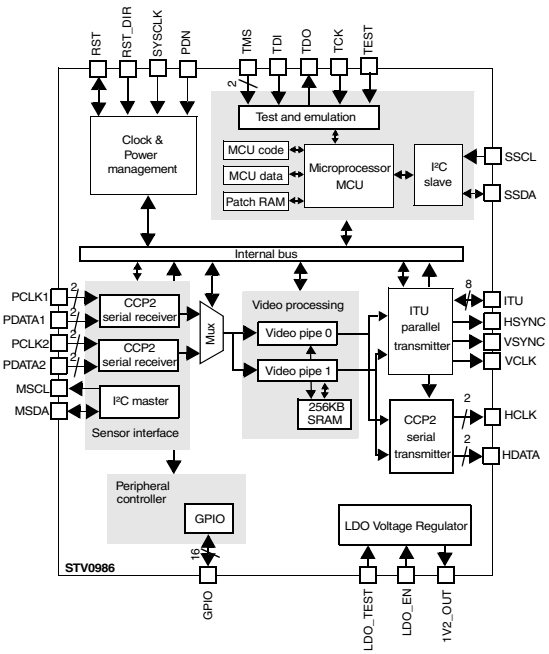


Figure 2. Block diagram



Ordering information

Table 3. Order codes

Part number	Description
STV0986/TR (Tape and Reel)	Rohs compliant (Leadfree) TFBGA 84 balls

Revision history

Table 4. Document revision history

Date	Revision	Changes
08-Jan-2007	1	Initial release.

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