Freescale Semiconductor
Product Brief

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SCP2200 ICP Family

1 Overview

The SCP2200 is a family of automotive qualified Image Cognition Processors (ICP) designed to enable embedded vision systems that use intelligent algorithms to interpret meaning from images and video.

Powered by CogniVue's APEX™ technology, the SCP2200 family is the first series of ICPs offering a unique combination of high performance, low power, small footprint devices with the ability to target a variety of applications and perform application upgrades with software-only changes. SCP2201 includes 128 Mbit DDR SDRAM.SCP2207 includes 512 Mbit DDR SDRAM.

With the exception of the SDRAM, SCP2207 is identical to SCP2201 and is therefore fully pin compatible.

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1.1 Target Applications

- Broad range of after-market automotive vision systems including:
  - o Smart rear-camera, de-warping, over-lay
  - o Driver monitoring camera
  - o Blind spot monitoring
  - o Lane detection, tracking and collision avoidance

1.2 Key Features

High performance with low power consumption

- APEX – a programmable 34B Ops/sec low-power Vision Processor using patented massively parallel Array Processor Unit (APU), a second ARM926 running at 350MHz, H/W acceleration blocks, wide-bandwidth stream DMAs and internal dual 64-bit AXI data buses to/from all blocks for computationally intensive applications
- ARM926EJTM master processor runs at a clock speed of 350MHz
- Comprehensive software enabling concurrent applications running on chip

1.3 Fully Programmable

- Comprehensive software development kit (SDK), tools and libraries
- Image cognition library and toolkits
- Video toolkit available with video and audio codecs
- Programmable APEX™ core enables support of standards and proprietary image processing algorithms
- Common API for controlling embedded applications and managing peripherals
- Field upgradeable to support new standard

1.4 Low Power Operation

- Multiple power domains and voltage islands support multiple low power options
- Effective clock gating and dynamic frequency scaling

1.5 Programmable High Performance Processing

Intelligent Imaging Analytics

- Feature extraction for corner/edge/shape, blob detection
- Motion detection and tracking and others.
- Image enhancement, image pre-processing/filtering
- Image registration
- Overlay merging and image manipulation
- Image de-warping
- 100+ primitives

1.6 Programmable Video and Image Codecs

- Video encode/decode of MPEG4, D1 @ 30fps.
- For video decoding other standards are supported, consult factory for availability.

1.7 Programmable Audio Codecs

- Voice/audio codecs: AAC/AAC+, MP3. For other codecs consult factory for availability.

1.8 Peripheral Interfaces

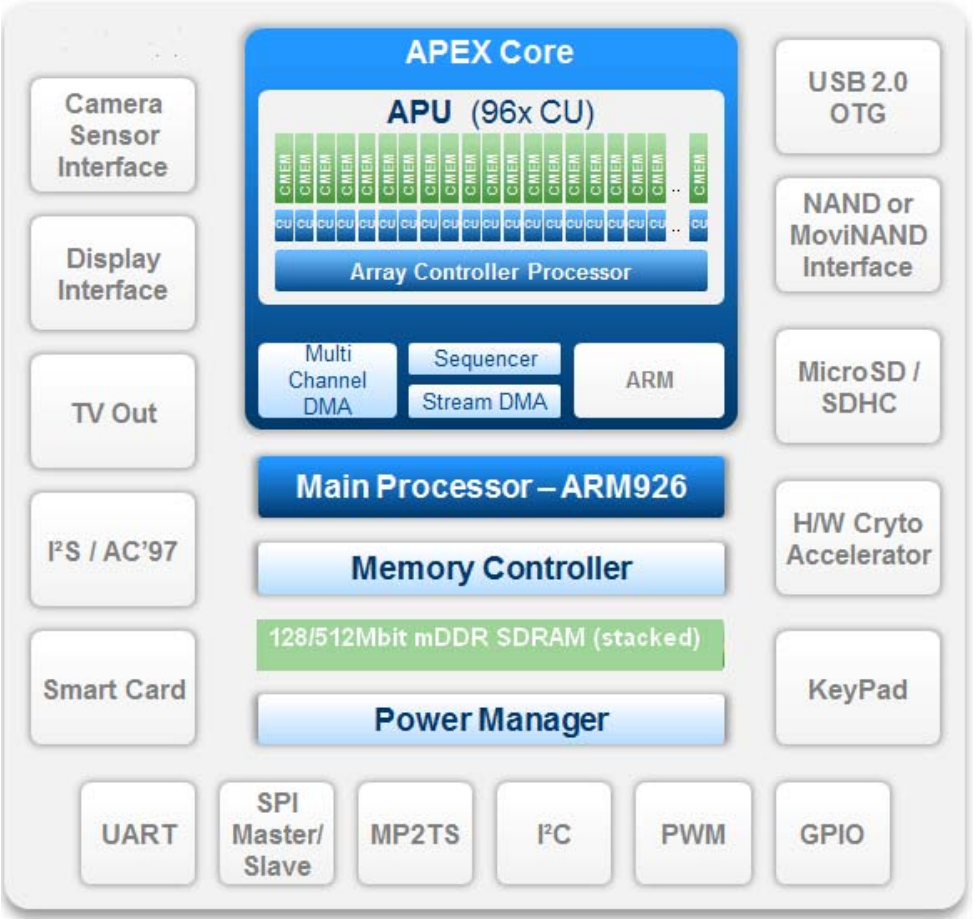

Figure 1. SCP 2200 Family Block Diagram

Sensor

- 10-bit parallel data input (Data, H/VSync, Clock). Supports YUV and native JPEG compressed data interface formats; VGA to 10M-pixel sensors resolution.

USB Interface

- USB 2.0 OTG

Media Storage Interface

- Supports SD/MMC, SDHC, T-Flash, NAND, MoviNAND
- Up to four 8-bit NAND flash devices supporting 64 Mbit to 8 Gbit
- FAT-32 file system with long name support and international characters

Display Interface

- Single TFT LCD or up to 4 CPU-type LCDs (16/18/24-bit data width) simultaneous with NTSC/PAL TV output
- Alpha-blending, overlay, rotation
- Up to WVGA resolution on LCD interface simultaneous with NTSC/PAL TV composite output.

Serial Interfaces

- UART(2x), I2C(2x), SPI(2x), I2S/AC'97

Other Interfaces

- Multiplexed GPIO signals (96 GPIOs), 2 PWM outputs
- JTAG interface for debugging and testing

Reference Input Clock

- 10-30 MHz supplied by crystal or oscillator

Boot Options

- Boot from NAND or SPI

Memory

- SCP2201 has a 128 Mbit stacked DDR SDRAM in package.
- SCP2207 has a 512 Mbit stacked DDR SDRAM in package.

Packages

- SCP2201 and SCP2207 are both supplied in the 236 MAPBGA package (9 x 9 x 1.24mm).

Power

- 1.0V core and 1.8V/2.5V/3.3V I/O
- Active, Active Standby, Core Power OFF control
- Power consumption for typical image processing applications such as image dewarp is ~ 250mW
- Power consumption for MPEG4 encode at D1(720x480), 30 fps is 181mW

Operating Temperature

- -40°C to +105°C

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