Image Cognition Processors

SCP2200 Family

Image cognition processors for low-power, high-performance automotive image processing

Overview

The SCP2200 family of image cognition processors (ICPs) is designed to enable programmable intelligent imaging and video applications for automotive vision systems. Powered by CogniVue APEX™ programmable technology, the SCP2200 family is the first in a series of ICPs offering a unique combination of high performance, low power and small footprint.

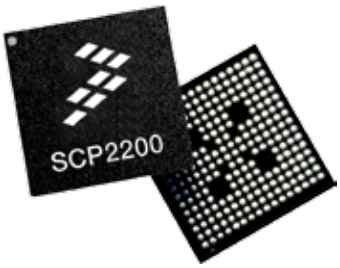
The SCP2200 ICP family utilizes the ARM926EJ™ core as the main RISC processor and runs at a frequency of 350 MHz. Image cognition processing is handled by the APEX array—a fully programmable low-power SIMD subsystem using a massively parallel array processor unit (APU), a second ARM926™ processor running at 350 MHz, hardware acceleration blocks, wide-bandwidth stream DMAs and internal dual 64-bit AXI data buses to/from all blocks for computationally intensive applications. The SCP2200 family also supports video encode/decode at up to D1 (720 x 480) at 30 fps.

SCP2200 is a fully programmable solution and enabled by a comprehensive software suite for image cognition processing applications (ICP SDK). A wide range of video codecs is supported, including MPEG-4 and h.264. The fully programmable APEX core technology and common API will enable support of new emerging standards and proprietary algorithms with simple firmware changes.

The SCP2200 parallel ICP architecture enables concurrent processing of image data translating into high performance at a lower clock frequency than competitive solutions while the revolutionary data movement architecture enables high-bandwidth image data processing at very low power.

Target Applications

- Smart reverse camera with object detection and distance measurement
- Smart surround view camera
- Lane detection and tracking
- Fisheye correction
- Driver monitoring
- Blind spot detection



Software and Development Tools

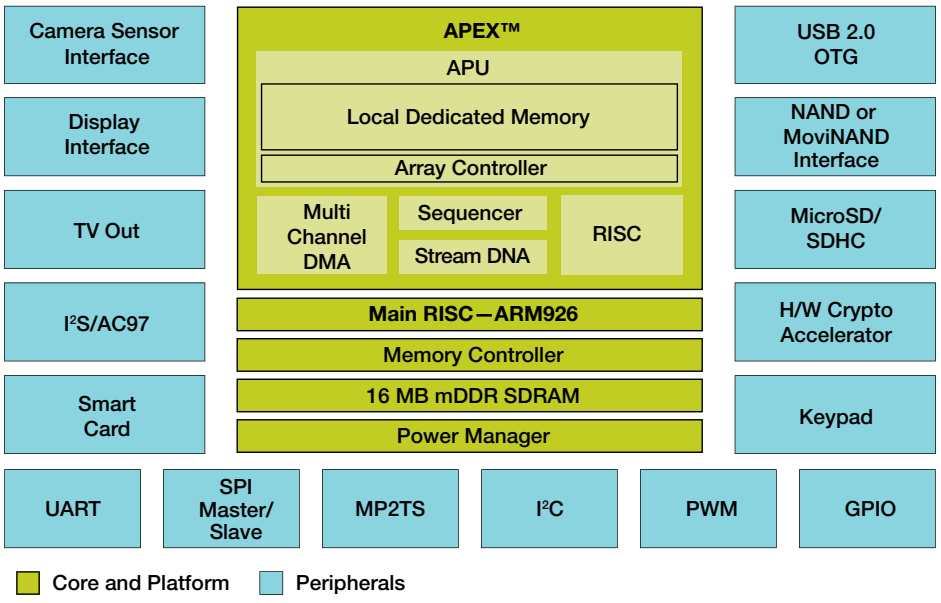
A comprehensive suite of libraries, hardware and software development tools are available to help simplify and speed system design.

- Comprehensive software development kit (SDK) for image cognition processing applications
- Rapid prototyping development kit (RDK) including:
  - SCP2201 image cognition processor
  - WVGA LCD
  - 1 GB SDRAM
  - Touch screen controller
- SmartVue development camera module
  - SCP2201-based smart camera design

SCP2200 Family Key Features

	SCP2201	SCP2207
Main RISC core	• ARM926EJ™ RISC CPU main processor	
ICP	• APEX image cognition processor capable of up to 34 billion ops/sec	
SDRAM	• 128 Mb	• 256 Mb
Sensor interface	• 10-bit parallel data input with serial control interface, supports YUV and native JPEG compressed data interface formats	
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 MB to 8 GB • FAT-32 file system with long name support and international characters	
Display output	• Up to 4 CPU-type LCDs (12/16/18/24-bit data width) • NTSC/PAL TV output • A WVGA resolution RAM-less RGB LCD simultaneous with NTSC/PAL TV	
Serial and other interfaces	• 2 UART, I²C, SPI, I²S/AC'97, smart card • Multiplexed GPIO signals • Two PWM outputs • JTAG interface for debugging and testing	
Power	• 1.0 V core and 1.8/2.5/3.3 V I/O • Active, active standby, core power off control • Power consumption for typical image processing applications such as image dewarp is ~ 250 mW • Power consumption for MPEG-4 encode at D1 (720 x 480), 30 fps is 181 mW	
Operating temperature	• –40 °C to +85 °C and –40 °C to +105 °C options available	
Packages	• 9 x 9 mm BGA with 236 balls	• 9 x 9 mm BGA with 236 balls

SCP2200 Family Block Diagram



For current information, visit freescale.com/SCP2200

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