S32V Series

S32V234: 64-bit Multi-core A53 processor for vision and ADAS applications

Product Summary

The NXP® S32V234 is a high-performance processor with the right set of features to support safe computation-intensive applications around vision and sensor fusion for transportation and industrial markets. It includes quad Arm Cortex®-A53 cores running at up to 1 GHz, dual APEX-2 vision accelerators enabled by OpenCL™ and OpenCV™, 3D GPU (Vivante GC3000), MIPI CSI2 and parallel image sensor interfaces, embedded ISP for HDR, color conversion, tone mapping, etc. and 4 MB on chip system RAM.

The S32V234 processor addresses ISO 26262 ASIL B/C requirements and includes the CSE2, a hardware security encryption module together with Arm TrustZone® technology that provides protection against IP theft and malicious hacking.

1 S32V234 Processor Specification Highlights

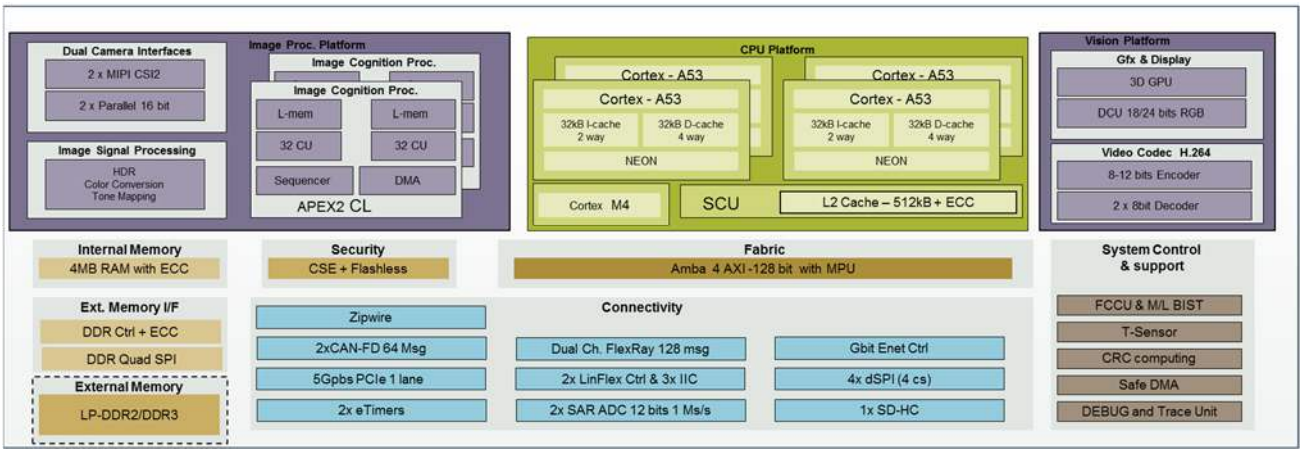
High Performance Processing – Up to Quad core Arm A53 600-1GHz Safe Clusters @ ~10000 DMIPS

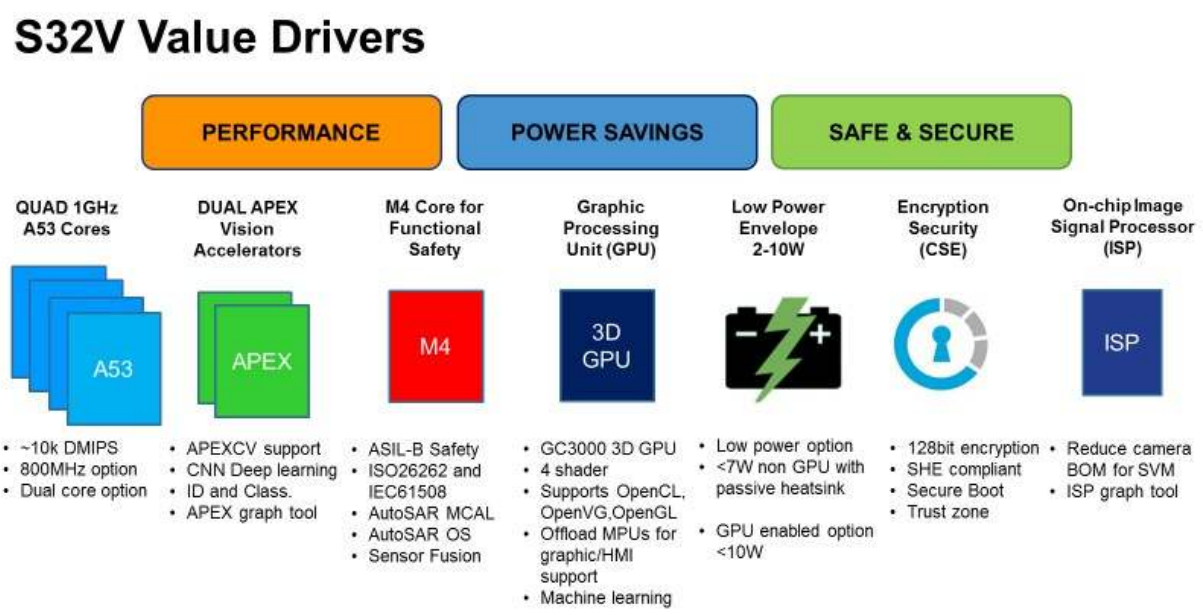
Vision Acceleration – Dual APEX-2 image cognition processor cores enabled by OpenCV

Automotive Safety – Developed according to ISO 26262 standard reaching ASIL B and higher

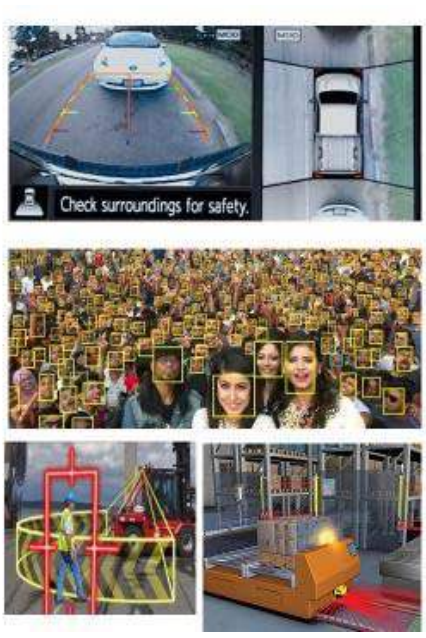
Security Enabled – HIS-SHE compliant Crypto Service Engine optimized for flash less devices

S32V234 Functional Block Diagram



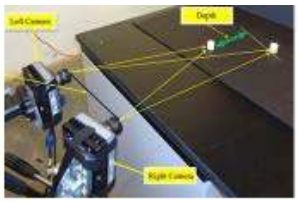
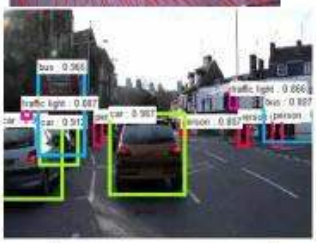
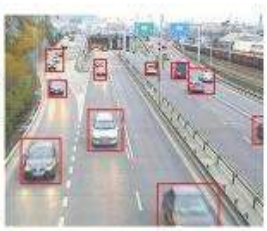


2 Target Application



Surround View
Front Cameras
Rear Cameras
Sensor Fusion
Lane Departure
360° Surround View
Facial Recognition
Optical Flow
Traffic Count
Autonomous Farming

Machine Vision
Autonomous Drive
Object Classification
Pedestrian Detection
Stereo Disparity
CNN/DNN Neural Networks
Drone / UAV Safety

3 Part Attributes

General Purpose Processing

- Two 2 x Arm A53 Safe Clusters
    - 64 bit, 1.0 GHz
    - 2 x 256 KB L2 cache per cluster
    - Neon SIMD
    - ~10,000 DMIPS
- 2 x 32b DDR3/LPDDR2 at 533 MHz

Accelerated Processing

- Image Signal Processing

- 2 x APEX2 – Image cognition Processing
  Open CL
- h.264 Codec and MJPEG decoder
- 3D GPU GC3000 (4 Shader)

Functional SAFETY

- Classic ASIL B/C capable SoC
- LBIST, MBIST
- Voltage and temperature monitoring
- Full memory ECC, E2E ECC
- Software Core Self Tests
  - Software independent fault monitoring and reporting
- Safe DMA, CRC processing and MCAL

High Speed Serial Interfaces

- 1 PCIe controllers
- 1 dual channel FlexRay®
- 1 Zipwire
- 2 x MIPI CSI2 - 4 lanes 6 Gb/s

Low Speed Serial Interfaces

- 2 CAN –FD
- 4 SPI, 2 LinFLEX
- 4 x Timer
- FlexRay

Security

- 1 CSE3 – Flashless

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4 Development tools and Ecosystem

Evaluation Boards / Hardware

SBC-S32V234

- The SBC-S32V234 is a EVB consisting of
  - MPX-S32V234 is a SOM based adapter with the S32V234 MPU
  - CRX-S32V234 is the carrier board adapter that MPX-S32V234 plugs into

OV10640CSP-S32V

The OV10640CSP-S32V is a MIPI camera that features the OV10640 image sensor. This camera allows users to make full use of the ISP integrated in the S23V234 MPU.

S32V234-EVB2

The NXP S32V234-EVB2 is an evaluation system and development platform.

Features:

- Video input (VIU connectors, 2 x MIPI)
- Video Output (RGM to LVDS converter, RGB to HDMI converter)
- Ethernet and FlexRay
- Memory plus SD card slot

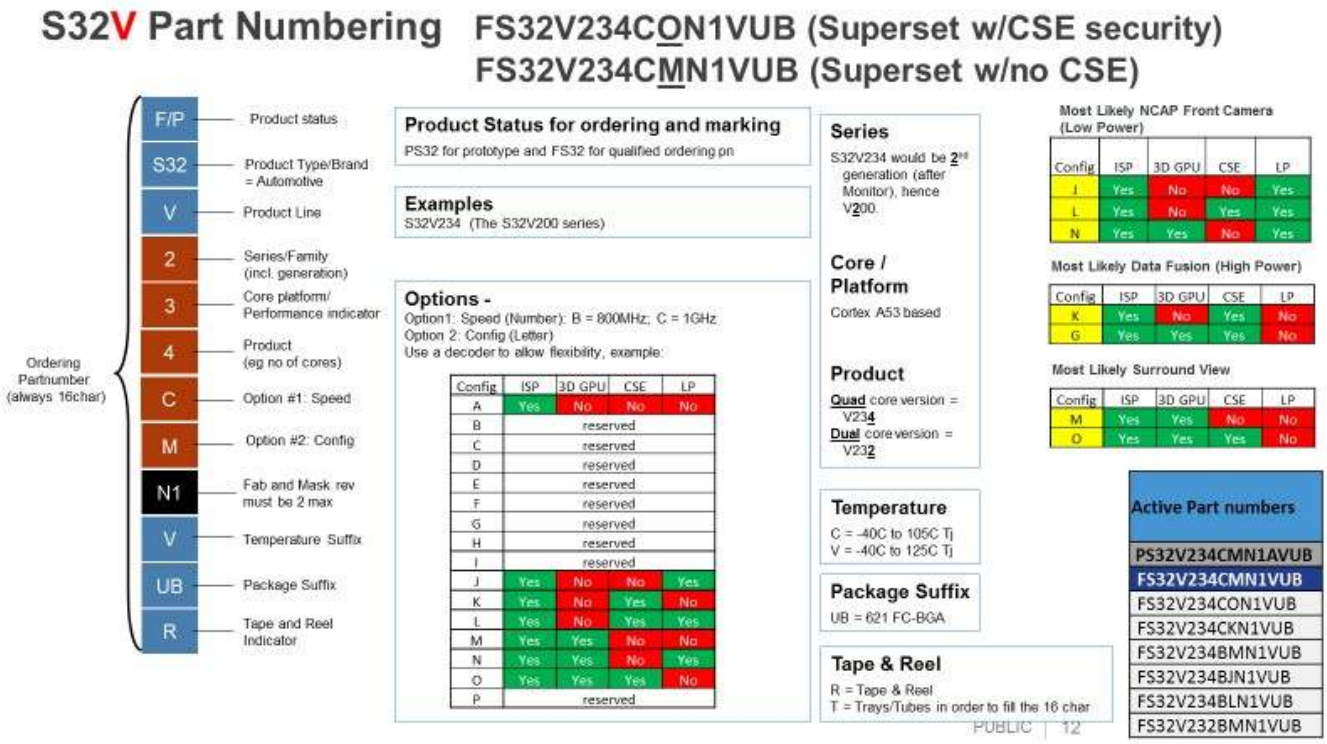
- Various Communication and General IO connectors
- Accelerometer and magnetometer plus gyroscope
- Expansion card options

MXOV10635-S32V

The Maxim MXOV10635-S32V is a LVDS Camera that features the OV10635 image sensor which integrates an image signaling processor.

MAX9286S32V234

The Maxim MAX9286S32V234 is a deserializer adapter for expanding 1x MIPI port to up to 4 LVDS cameras for surround view.



Config	ISP	3D GPU	CSE	LP
A	Yes	No	No	No
B	reserved			
C	reserved			
D	reserved			
E	reserved			
F	reserved			
G	reserved			
H	reserved			
I	reserved			
J	Yes	No	No	Yes
K	Yes	No	Yes	No
L	Yes	No	Yes	Yes
M	Yes	Yes	No	No
N	Yes	Yes	No	Yes
O	Yes	Yes	Yes	No
P	reserved			

Config	ISP	3D GPU	CSE	LP
J	Yes	No	No	Yes
L	Yes	No	Yes	Yes
N	Yes	Yes	No	Yes

Config	ISP	3D GPU	CSE	LP
K	Yes	No	Yes	No
G	Yes	Yes	Yes	No

Config	ISP	3D GPU	CSE	LP
M	Yes	Yes	No	No
O	Yes	Yes	Yes	No