



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

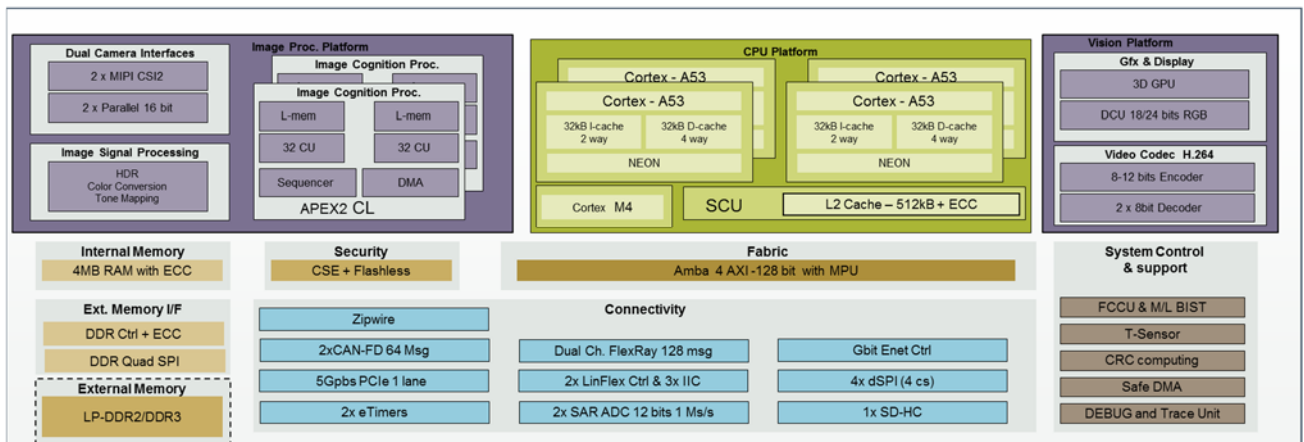
High Performance Processing – Up to Quad core Arm A53 600-1GHz Safe Clusters @ ~10000 DMIPS

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

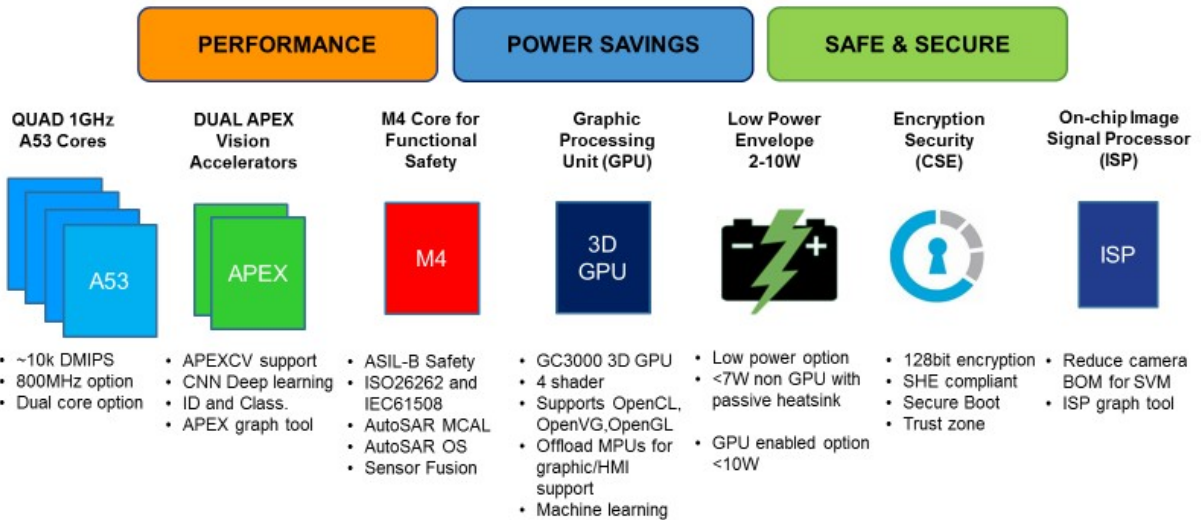
Automotive Safety – Developed according to ISO 26262 standard reaching ASIL B and higher

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

S32V234 Functional Block Diagram



S32V Value Drivers



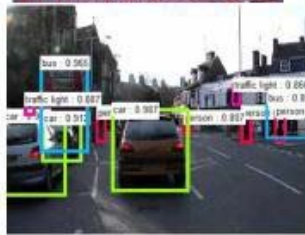
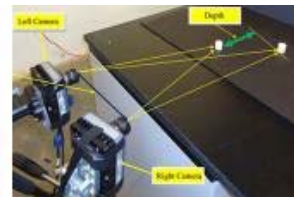
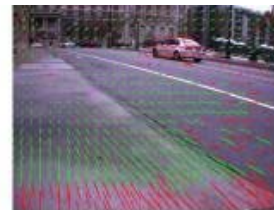
2 Target Application



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

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.

S32V Part Numbering FS32V234CON1VUB (Superset w/CSE security) FS32V234CMN1VUB (Superset w/no CSE)

Ordering Partnumber (always 16char)

- F/P** — Product status
- S32** — Product Type/Brand = Automotive
- V** — Product Line
- 2** — Series/Family (incl. generation)
- 3** — Core platform/ Performance indicator
- 4** — Product (eg no of cores)
- C** — Option #1: Speed
- M** — Option #2: Config
- N1** — Fab and Mask rev must be 2 max
- V** — Temperature Suffix
- UB** — Package Suffix
- R** — Tape and Reel Indicator

Product Status for ordering and marking
PS32 for prototype and FS32 for qualified ordering pn

Examples
S32V234 (The S32V200 series)

Options -
Option1: Speed (Number): B = 800MHz; C = 1GHz
Option 2: Config (Letter)
Use a decoder to allow flexibility, example:

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		

Series
S32V234 would be 2nd generation (after Monitor), hence V200.

Core / Platform
Cortex A53 based

Product
Quad core version = V234
Dual core version = V232

Temperature
C = -40C to 105C Tj
V = -40C to 125C Tj

Package Suffix
UB = 621 FC-BGA

Tape & Reel
R = Tape & Reel
T = Trays/Tubes in order to fill the 16 char

Most Likely NCAP Front Camera (Low Power)

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

Most Likely Data Fusion (High Power)

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

Most Likely Surround View

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

Active Part numbers

PS32V234CMN1AVUB
FS32V234CMN1VUB
FS32V234CON1VUB
FS32V234CKN1VUB
FS32V234BMN1VUB
FS32V234BJN1VUB
FS32V234BLN1VUB
FS32V232BMN1VUB