

DESIGNCORE[®]

RVP-TDA4Vx DEVELOPMENT KIT



The Ruggedized Platform for TI's TDA4Vx SoC to evaluate and develop applications for use in ADAS technologies utilizing sensor fusion, deep learning, and analytics.

Rugged Vision Platform (RVP) with TI TDA4Vx Automotive Processor

SPEED DEVELOPMENT OF AUTONOMOUS VISION-BASED NAVIGATION SYSTEMS

The DesignCore RVP Development Kit features the TDA4VM SOM, a customizable baseboard, an expansion interface, a personality card for multiple SerDes configurations, and multiple IO options for high-speed sensor interfaces. The RVP enables simple vehicle integration for development of ADAS, sensor fusion, and deep learning applications.

The Development Kit is based on TI's advanced automotive processor, Processor-SDK vision, and D3's software framework. It provides simultaneous capture, processing, and analysis of up to 8 high-speed SerDes data streams with serial back channel data, and storage to the local memory. The system is designed to support IP64 environmental ratings, with a path to IP67. The system is targeted to meet ASIL ratings, with the main processor targeting ASIL-B, and the MCU safety island targeting ASIL-D. Validation testing for IPx ratings and safety ratings is needed, design intent only.

FEATURES

Texas Instruments[®] TDA4VM SoC

- Internal ISP capable of processing 8 2MP cameras streams

DisplayPort with MST or FPD-Link™ III display options

- Interface support for Dual Ethernet Ports, USB 3.1/C, and 6x CAN-FD Bus ports (2 with wake options)

- Multiple storage options including UFS, PCIe SSD, External PCIe, and USB

- Sensor input support for up to 8x high speed cameras, 6x RADAR units via CANFD or Ethernet, Ultrasonic units via serial port, and LIDAR units via Ethernet or USB

- CSI-2-TX Port enables Hardware In the Loop (HIL) development support for algorithm verification

- Compact, rugged packaging

APPLICATIONS

Advanced Driver Assistance Systems (ADAS)

- Automated Valet Park (AVP)

- Deep Learning and Analytics

- Object Identification and Tracking

- Collision Avoidance

- Driver Notification

- Multi-Camera Display

- Mirror Replacement

- Driver and Cabin Monitoring

- Infotainment and

- Telematics

Autonomous Guided Vehicles

Industrial Vehicle Systems

Sensor Fusion

- RADAR, Ultrasonic, and LIDAR

- High MP cameras

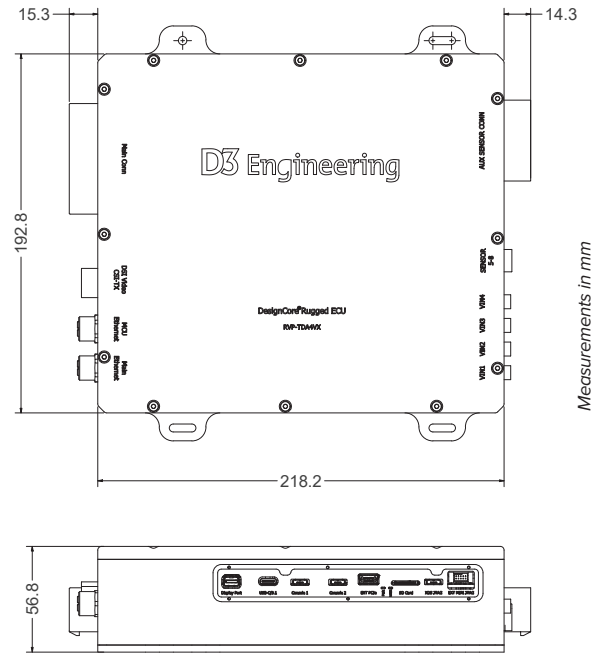
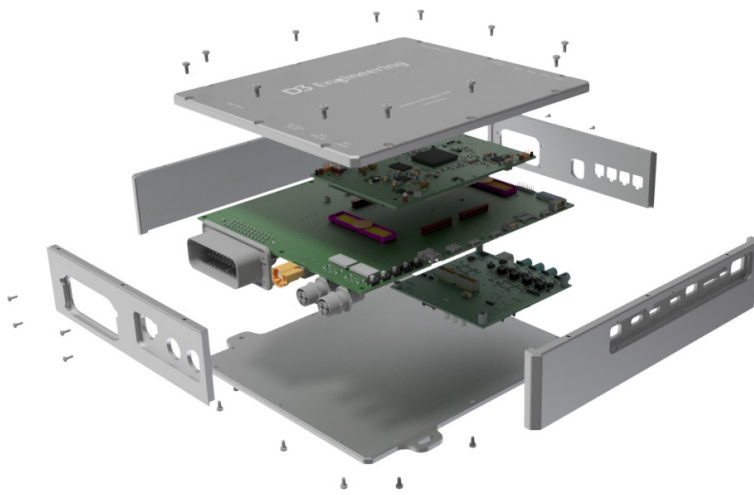
- Safety and Security Critical Systems

SPECIFICATIONS

TDA4VM/J721 SoC

A72 Cores	2x, 64 bit ARM Cortex, up to 1.8 GHz
R5F Cores	4x, general compute partition
Safety Island MCU R5F Cores	2x, floating point coprocessor and lock step, targeted to meet ASIL-D safety requirements/certification
DSP Cores	1x, C7x Floating Point Vector DSP up to 1.0 GHz, 80 GFLOPS, 256 GOPS 2x C66x Floating Point DSP, up to 1.35 GHz, 40GFLOPS
GPU	1x PowerVR Rogue 8XE GE8430 GPU for 3D and 2D acceleration up to 750MHz, 96 GFLOPS, 6 Gpix/sec
DDR	LPDDR4 4GB + ECC
eMMC FLASH	16GB
OSPI	64MB HyperFLASH/HyperRAM + 64MB OSPI FLASH
UFS	32GB
Ethernet Gbit (DP83867)	2x: 1 MCU Island, 1 Main
Video Port Capture	2x 4-Lane MIPI CSI-2 channels, up to 2.5Gbps/lane with support for: 8 channel FPD Link III, 8 channel FPD Link IV, 8 channel GMSL-2, or 2 channel RAW MIPI CSI-2
Vision Processing	Vision Processing Accelerators with Image Signal Processor (ISP) up to 720 Mpix/sec
Deep Learning	Matrix Multiply Accelerator (MMA) up to 8 TOPS (8b) at 1.0 GHz
Display	1x Mini DisplayPort supports up to 3 Full HD 1080p displays via MST, 1x FPD Link III, Interface is alternately used for Hardware In the Loop (HIL) data
Video Port Output	1x 4-Lane MIPI CSI2-TX
CAN	6x CAN-FD (total) 2x CAN-FD with Wake (1x MCU MCAN, 1x Main MCAN)
UART	4x through USB 2.0 Hub, 1x RS232, 1x One Wire Interface, 1x LVCMOS
uSD Card	1x external
External IO	Isolated: 2 in / 2 out (3.3V – 22V) 5V tolerant buffered: 2 in / 2 out
USB	1x USB 3.1/C – configurable as DRP, DRP, UFP
PCIe	1x internal PCIe 2L M.2 slot (M key) for optional SSD/1x external PCIe 2L supporting HyperLink (separate cable required), configurable as Root or Endpoint complex
IMU	1x 6 axis accelerometer/gyro
Expansion	1x RGMII, 1x SGMII, 10x GPIO, 1x I3C, 1x I2C, 1x UART, 5V (up to 1A), 3.3V (up to 1A), Regulated 12V (Up to 1A)
Debug	XDS110 support via USB 2.0, JTAG via 60 pin MIPI header, 10 pin with adapter
Access Panel	JTAG, 2x USB/UART, Mini Display Port, uSD card (SD3.0), USB 3.1/C, PCIe
Enclosure	Rugged Aluminum
Ambient Temperature	Design Intent of -40 to 70C*
Component Temperature	-40C to 85C*
Power	9V to 40VDC with reverse battery protection

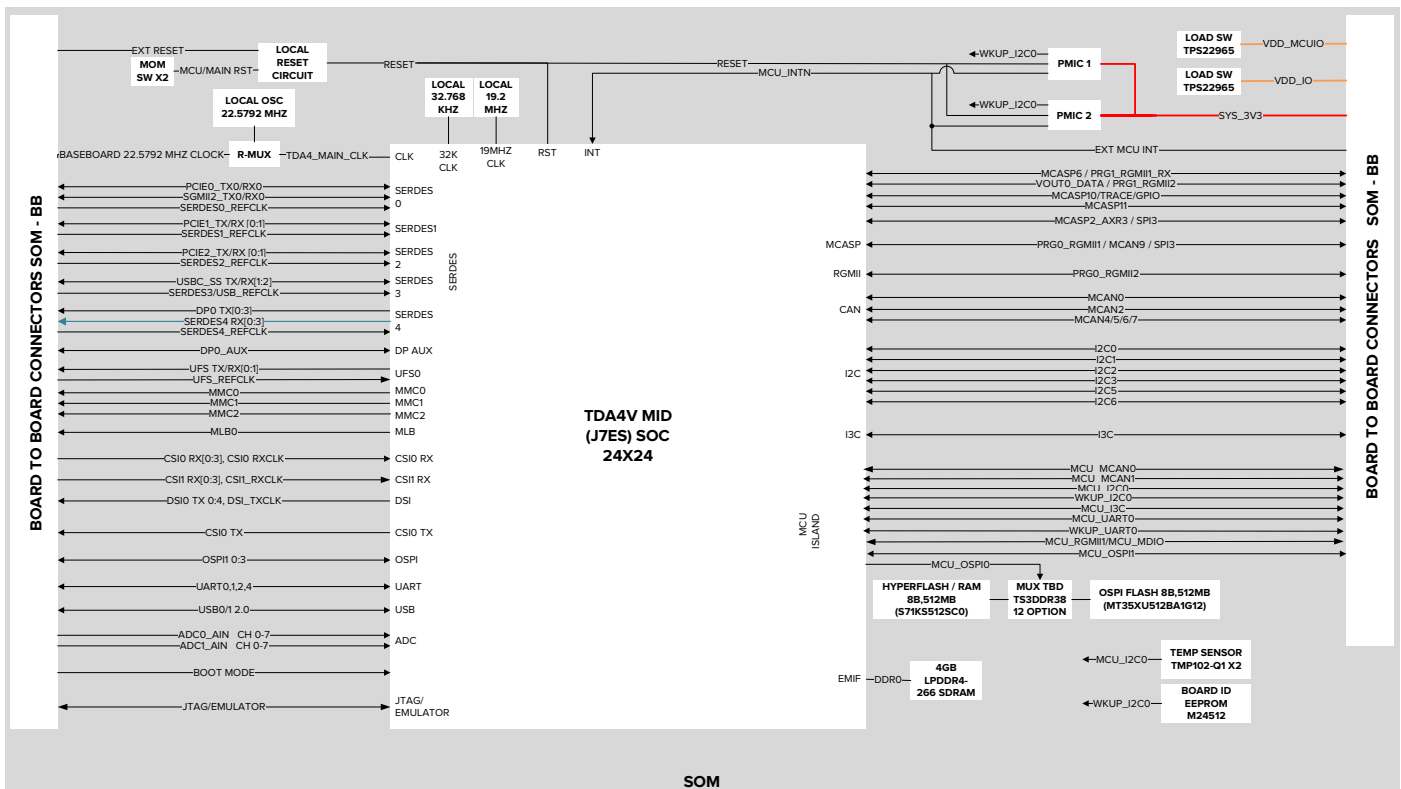
*Processor loading dependent. Contact D3 for more information.



Measurements in mm

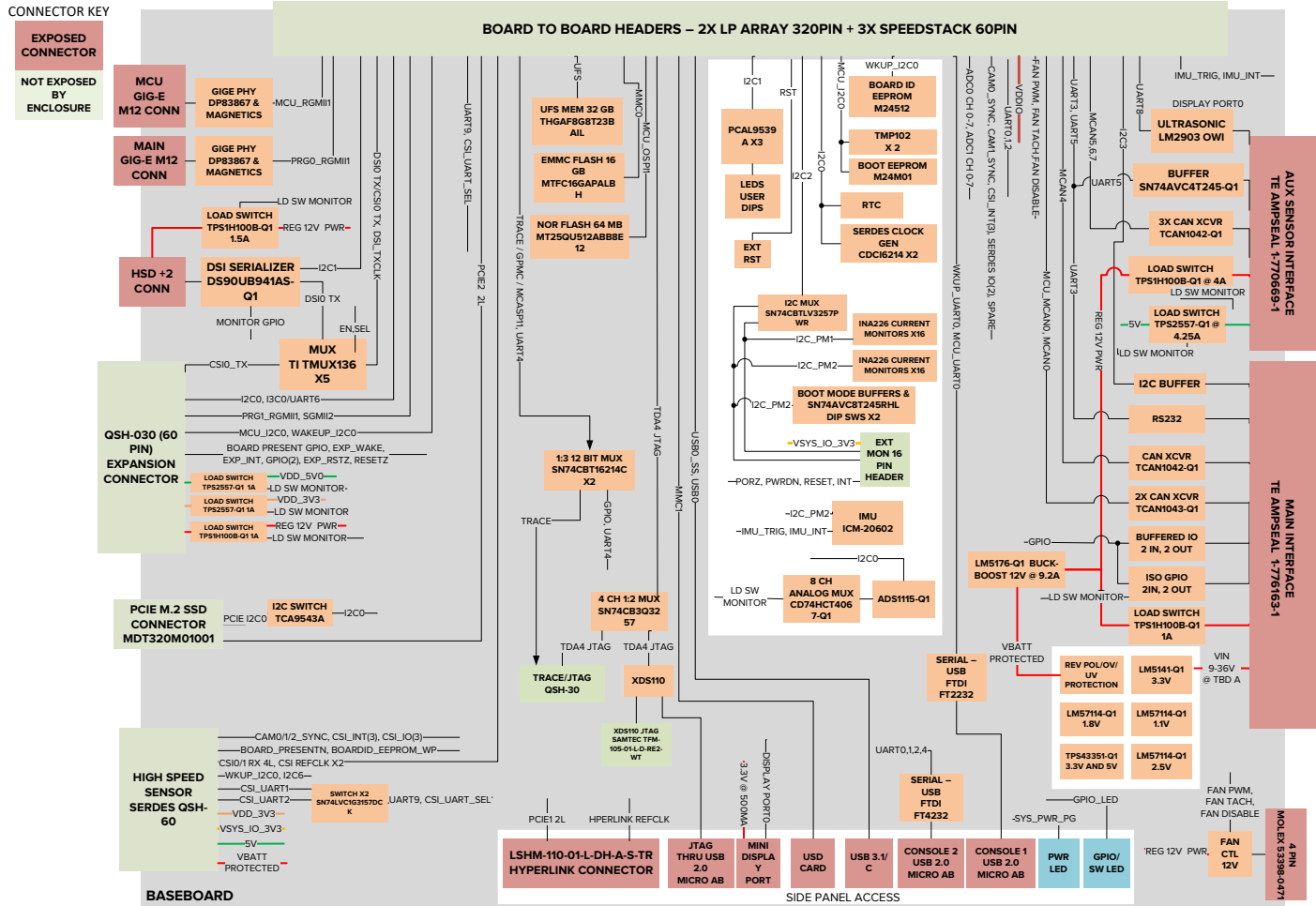
The RVP Development Kit features an optimized SOM board with advanced vision processor, firmware, and a customizable baseboard with IO, power, expansion interface, and more. We use the Development Kit to rapidly develop your Engineering Verification Test (EVT) unit or A-sample.

TDA4Vx SOM BLOCK DIAGRAM



SOM

TDA4Vx BASEBOARD BLOCK DIAGRAM



FPD-LINK™ III CSI-2 PERSONALITY INTERFACE CARD BLOCK DIAGRAM

