

The TDA4VM processor family is based on the evolutionary Jacinto™ 7 architecture, targeted at ADAS and Autonomous Vehicle (AV) applications and built on extensive market knowledge accumulated over a decade of TI's leadership in the ADAS processor market. The unique combination high-performance compute, deep-learning engine, dedicated accelerators for signal and image processing in an functional safety compliant targeted architecture make the TDA4VM devices a great fit for several industrial applications, such as: Robotics, Machine Vision, Radar, and so on. The TDA4VM provides high performance compute for both traditional and deep learning algorithms at industry leading power/performance ratios with a high level of system integration to enable scalability and lower costs for advanced automotive platforms supporting multiple sensor modalities in centralized ECUs or stand-alone sensors. Key cores include next generation DSP with scalar and vector cores, dedicated deep learning and traditional algorithm accelerators, latest Arm and GPU processors for general compute, an integrated next generation imaging subsystem (ISP), video codec, Ethernet hub and isolated MCU island. All protected by automotive grade safety and security hardware accelerators.

Key Performance Cores Overview

The "C7x" next generation DSP combines TI's industry leading DSP and EVE cores into a single higher performance core and adds floating point vector calculation capabilities, enabling backward compatibility for legacy code while simplifying software programming. The new "MMA" deep learning accelerator enables performance up to 8 TOPS within the lowest power envelope in the industry when operating at the typical automotive worst case junction temperature of 125°C. The dedicated ADAS/AV hardware accelerators provide vision pre-processing plus distance and motion processing with no impact on system performance.

General Compute Cores and Integration Overview

Separate dual core cluster configuration of Arm Cortex-A72 facilitates multi-OS applications with minimal need for a software hypervisor. Up to six Arm Cortex-R5F subsystems enable low-level, timing critical processing tasks to leave the Arm Cortex-A72's unencumbered for applications. The integrated "8XE GE8430" GPU offers up to 100 GFLOPS to enable dynamic 3D rendering for enhanced viewing applications. Building on the existing world-class ISP, TI's 7th generation ISP includes flexibility to process a broader sensor suite, support for higher bit depth, and features targeting analytics applications. Integrated diagnostics and safety features support operations up to ASIL-D/SIL-3 levels while the integrated security features protect data against modern day attacks. To enable systems requiring heavy data bandwidth, a PCIe hub and Gigabit Ethernet switch are

included along with CSI-2 ports to support throughput for many sensor inputs. To further the integration, the TDA4VM family also includes an MCU island eliminating the need for an external system microcontroller.