# TDA2Eco ADAS System-on-Chip Family

Overview

TI's new **TDA2Eco system-on-chips** (SoCs) are a highly optimized and scalable family of automotive processors designed to meet the requirements of leading Advanced Driver Assistance Systems (**ADAS**). The TDA2Eco family targets today's entry-to-mid-range automobiles by integrating an optimal mix of performance and low-power processing. The new TDA2Eco family joins the **TDA2** and **TDA3** ADAS processors to extend TI's offering for **3D surround-view applications** supporting entry, mid-range and luxury automobiles.

Key features and benefits

- Heterogeneous, scalable architecture providing optimal mix of performance and low-power processing
- Integration of peripherals – up to eight camera interfaces (parallel, serial including CSI-2), display, CAN, Gigabit Ethernet AVB
- Supports entry- to mid-level 3D surround view systems
- Multiple, flexible parallel video and CSI-2 input and output ports
- Gigabit Ethernet AVB to support LVDS- and Ethernet-based surround-view systems
- Hardware accelerated subsystem for H.264 video decoding and encoding
- Pin-to-pin and software compatible with the TDA2x family
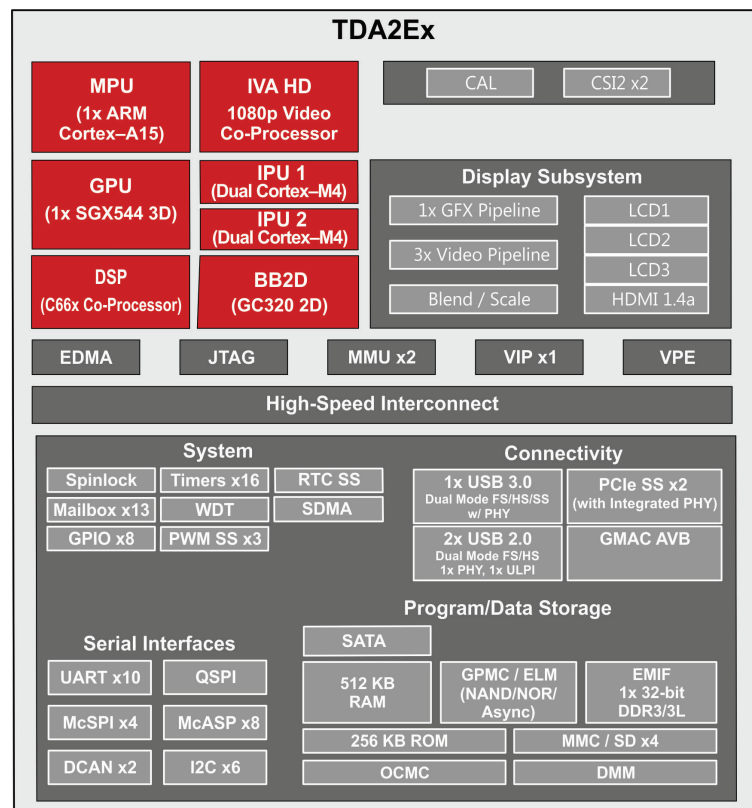
▲ *Figure 1: Block diagram for TDA2Eco SoC.*

TDA2Eco SoCs enable sophisticated embedded vision technology in today's automobiles by enabling a broad range of ADAS applications including park assist, surround view and sensor fusion in a single architecture. The TDA2Eco comes complete with support for safety and production ready software from third party providers and the optimized BOM includes companion parts such as PMIC **TPS65917-Q1** and **LM53603-Q1** DC-DC converter.

TDA2Eco architecture

The TDA2Eco ADAS SoC incorporates a heterogeneous, scalable architecture that includes TI's fixed- and floating-point TMS320C66x digital signal processor (DSP) core, ARM® Cortex®-A15 MPCore™ and quad-ARM Cortex-M4 processors. The integration of a video accelerator for decoding multiple video streams over an Ethernet AVB network, along with graphics accelerators for rendering virtual views, enable a robust 3D viewing
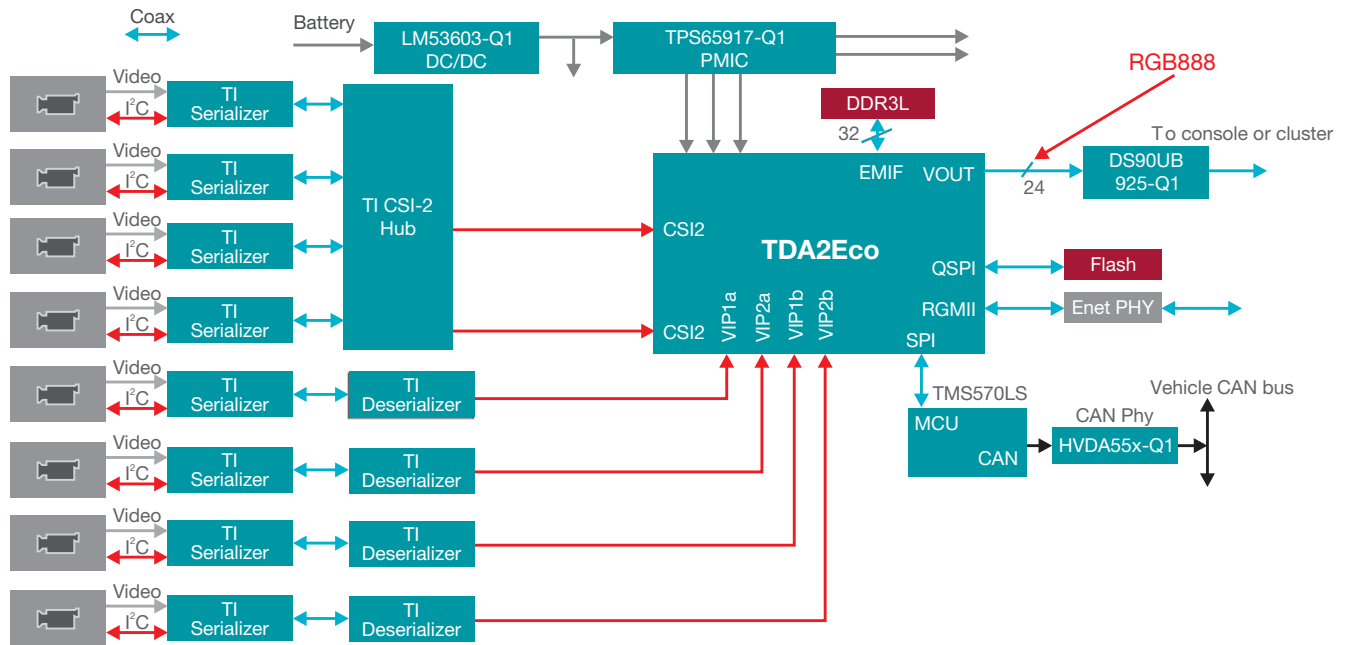
▲ *Figure 2: Eight-camera 3D surround-view system with TDA2Eco SoC.*

experience. Additionally, the TDA2Eco SoC integrates a host of peripherals such as multiple camera interfaces (parallel and serial, including CSI-2) for LVDS-based surround-view systems, display outputs, CAN and Gigabit Ethernet AVB.

The TDA2Eco SoC's C66x fixed- and floating-point DSP core operates at up to 700 MHz to support high-level signal processing, and up to 800-MHz Cortex-A15 cores for control and general-purpose processing. With 200 MHz of processing performance, the quad-ARM Cortex-M4 cores deliver efficient control and processing camera stream. TI's IVA-HD core is an imaging and video codec accelerator running at up to 532 MHz to enable full HD video encode and decode. Additionally, the TDA2Eco SoC has up to 512 KB of on-chip L3 RAM with single error

correction, double error detect (SECD-ED) support to minimize the impact of soft error rate (SER).

Another key component of the TDA2Eco SoC is the integrated peripherals. One video input port provides up to four camera inputs needed for LVDS-based surround vision applications. The CSI-2 interface enables additional camera inputs. The integrated high-performance Gigabit Ethernet with AVB enables Ethernet-based surround view.

Figure 2 shows an example surround-view system with TDA2Eco with eight video inputs (four through CSI-2 and four through parallel video inputs).

Tools and software

TI's ADAS-related Vision software design kit (SDK) enables customers to quickly and easily integrate DSP algorithms and then benchmark and

partition them across multiple processing elements. **Vision SDK** is a set of software development APIs, framework, tools and documentation that allows the creation of vision and analytics applications for TI TDAx ADAS processors.

Additionally, TI provides a complete set of development tools for the ARM and DSP cores, including C compilers, a DSP assembly optimizer to simplify programming and scheduling, and a debugging interface for visibility into source-code execution.

The TDA2Eco ADAS processor is qualified according to the AEC-Q100 standard.

For product details, white papers, other documentation and videos for TDA2Eco ADAS SoC, visit **www.ti.com/TDA2Eco** or contact your TI sales representative today.

TEXAS INSTRUMENTS

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