

TDA2Eco ADAS System-on-Chip Family

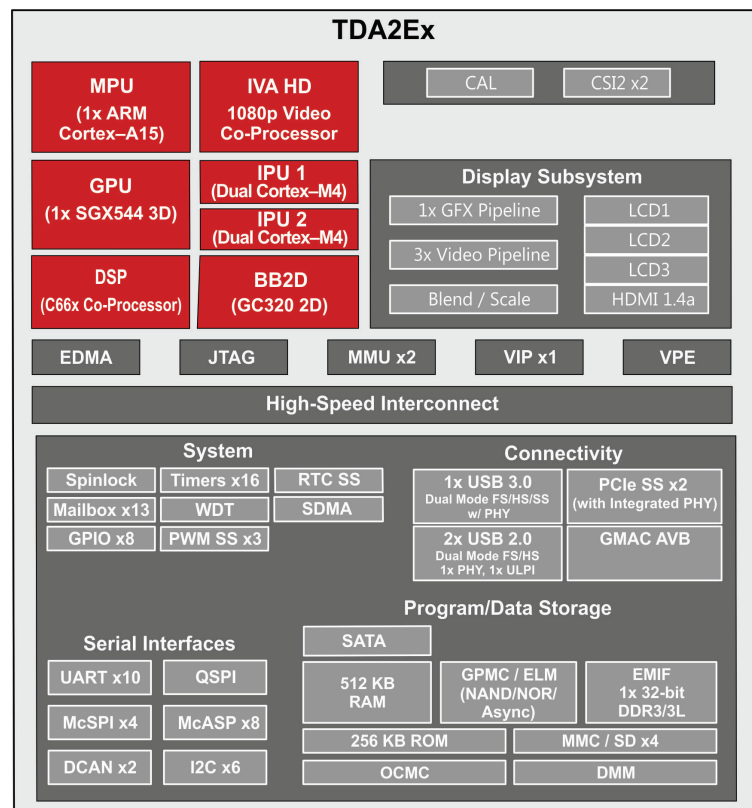


Overview

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

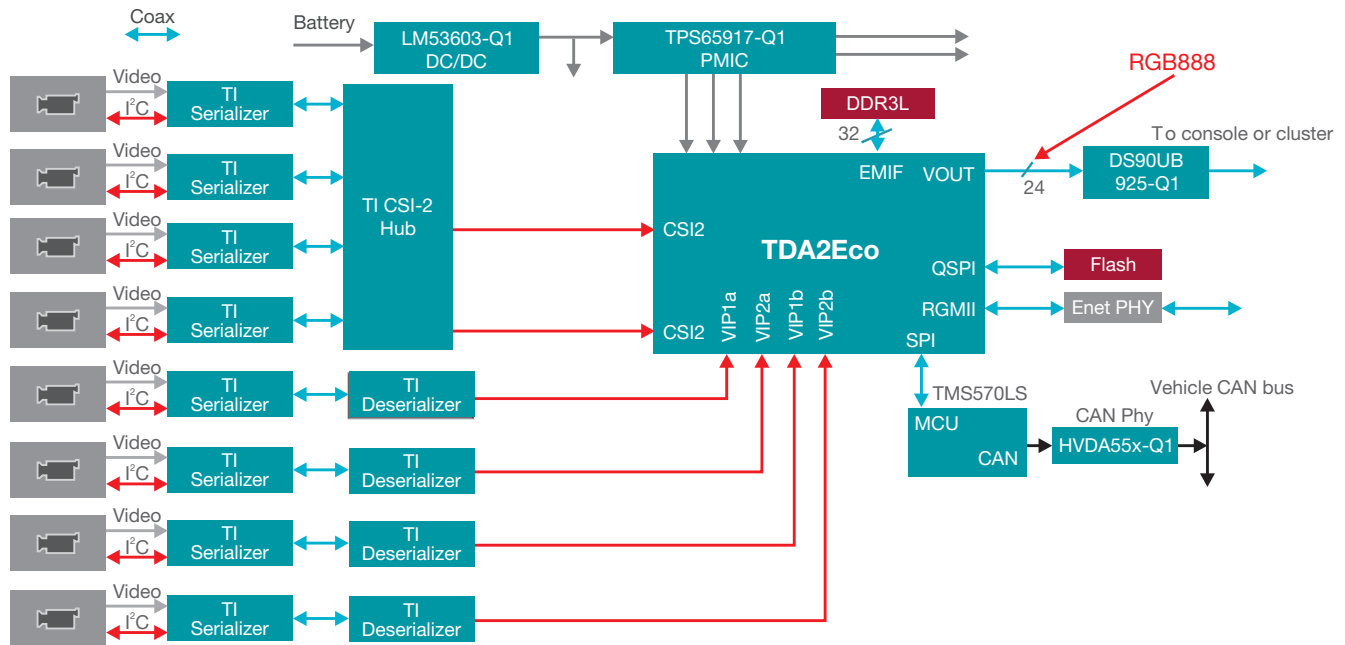


▲ Figure 1: Block diagram for TDA2Eco SoC.

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.

The platform bar is a trademark of Texas Instruments. All other trademarks are the property of their respective owners.

IMPORTANT NOTICE

Texas Instruments Incorporated and its subsidiaries (TI) reserve the right to make corrections, enhancements, improvements and other changes to its semiconductor products and services per JESD46, latest issue, and to discontinue any product or service per JESD48, latest issue. Buyers should obtain the latest relevant information before placing orders and should verify that such information is current and complete. All semiconductor products (also referred to herein as "components") are sold subject to TI's terms and conditions of sale supplied at the time of order acknowledgment.

TI warrants performance of its components to the specifications applicable at the time of sale, in accordance with the warranty in TI's terms and conditions of sale of semiconductor products. Testing and other quality control techniques are used to the extent TI deems necessary to support this warranty. Except where mandated by applicable law, testing of all parameters of each component is not necessarily performed.

TI assumes no liability for applications assistance or the design of Buyers' products. Buyers are responsible for their products and applications using TI components. To minimize the risks associated with Buyers' products and applications, Buyers should provide adequate design and operating safeguards.

TI does not warrant or represent that any license, either express or implied, is granted under any patent right, copyright, mask work right, or other intellectual property right relating to any combination, machine, or process in which TI components or services are used. Information published by TI regarding third-party products or services does not constitute a license to use such products or services or a warranty or endorsement thereof. Use of such information may require a license from a third party under the patents or other intellectual property of the third party, or a license from TI under the patents or other intellectual property of TI.

Reproduction of significant portions of TI information in TI data books or data sheets is permissible only if reproduction is without alteration and is accompanied by all associated warranties, conditions, limitations, and notices. TI is not responsible or liable for such altered documentation. Information of third parties may be subject to additional restrictions.

Resale of TI components or services with statements different from or beyond the parameters stated by TI for that component or service voids all express and any implied warranties for the associated TI component or service and is an unfair and deceptive business practice. TI is not responsible or liable for any such statements.

Buyer acknowledges and agrees that it is solely responsible for compliance with all legal, regulatory and safety-related requirements concerning its products, and any use of TI components in its applications, notwithstanding any applications-related information or support that may be provided by TI. Buyer represents and agrees that it has all the necessary expertise to create and implement safeguards which anticipate dangerous consequences of failures, monitor failures and their consequences, lessen the likelihood of failures that might cause harm and take appropriate remedial actions. Buyer will fully indemnify TI and its representatives against any damages arising out of the use of any TI components in safety-critical applications.

In some cases, TI components may be promoted specifically to facilitate safety-related applications. With such components, TI's goal is to help enable customers to design and create their own end-product solutions that meet applicable functional safety standards and requirements. Nonetheless, such components are subject to these terms.

No TI components are authorized for use in FDA Class III (or similar life-critical medical equipment) unless authorized officers of the parties have executed a special agreement specifically governing such use.

Only those TI components which TI has specifically designated as military grade or "enhanced plastic" are designed and intended for use in military/aerospace applications or environments. Buyer acknowledges and agrees that any military or aerospace use of TI components which have **not** been so designated is solely at the Buyer's risk, and that Buyer is solely responsible for compliance with all legal and regulatory requirements in connection with such use.

TI has specifically designated certain components as meeting ISO/TS16949 requirements, mainly for automotive use. In any case of use of non-designated products, TI will not be responsible for any failure to meet ISO/TS16949.

Products

Audio	www.ti.com/audio
Amplifiers	amplifier.ti.com
Data Converters	dataconverter.ti.com
DLP® Products	www.dlp.com
DSP	dsp.ti.com
Clocks and Timers	www.ti.com/clocks
Interface	interface.ti.com
Logic	logic.ti.com
Power Mgmt	power.ti.com
Microcontrollers	microcontroller.ti.com
RFID	www.ti-rfid.com
OMAP Applications Processors	www.ti.com/omap
Wireless Connectivity	www.ti.com/wirelessconnectivity

Applications

Automotive and Transportation	www.ti.com/automotive
Communications and Telecom	www.ti.com/communications
Computers and Peripherals	www.ti.com/computers
Consumer Electronics	www.ti.com/consumer-apps
Energy and Lighting	www.ti.com/energy
Industrial	www.ti.com/industrial
Medical	www.ti.com/medical
Security	www.ti.com/security
Space, Avionics and Defense	www.ti.com/space-avionics-defense
Video and Imaging	www.ti.com/video

TI E2E Community

e2e.ti.com