OMAP™ 5 mobile applications platform

Multiple simultaneous OSes and screens

OMAP™ 5 Platform

Secure wireless video streaming

Stereoscopic 3D and augmented reality

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Product Bulletin

TI's OMAP 5 platform transforms the concept of "mobile" to deliver truly unique mobile experiences.

- Delivers transformational mobile experiences
- Software support for leading mobile OSes and integrated and tested for real-world use cases
- Optimized power management technology to maximize battery life
- Pre-integrated, complementary WiLink™ single-chip connectivity (GPS, Wi-Fi®, *Bluetooth®* and FM)
- Pre-validated modem interface software to easily connect with any external modem

The OMAP 5 platform sets the stage for future mobile devices to transform from content consumption devices to primary computing devices. This includes support for content creation and editing, as well as supporting advanced experiences such as immersive 3D gaming, gesture recognition and augmented reality applications. The OMAP 5 system-on-chip (SoC) is the first featuring ARM®'s Cortex™-A15 MPCore™ on the market, as TI worked closely with ARM as the Advanced Lead Partner on the Cortex-A15's development.

Key features and benefits at a glance

Feature	Benefit
28 nanometer CMOS low-power process	The highest levels of processor performance and lowest power consumption
Smart multicore architecture with Symmetric Multiprocessing (SMP) including two ARM Cortex-A15 MPCore processors for SMP and two Cortex-M4 processors for low-power offload and real-time control	• Higher mobile computing performance • 2-3x higher performance versus previous generation • Faster user interfaces and less power consumption • Scalable performance activates only the cores that are needed for a particular process • Hardware virtualization through Hypervisor allows power and performance-efficient, multiple operating system (OS) support
IVA 3 HD multimedia accelerator	• Full high definition 1080p60 multi-standard video encode/decode and stereoscopic 3D encode/decode at 1080p30
Imagination Technologies' POWERVR™ SGX544 graphics core	• 5x performance increase versus previous generation enables compelling 2D and 3D interfaces and screens
Multi-core imaging and vision processing unit	• High-quality, high-megapixel digital SLR-like images at up to 24 MP (or 12 MP S3D) • On-the-fly support with real-time face detection, stabilization, noise filtering and 3D optimization to replace digital still cameras
TI proprietary M-Shield™ mobile security technology enhanced with ARM TrustZone® support and based on open APIs	• Unprecedented security capable of supporting enterprise and even premium content streaming applications on the go
SmartReflex™ 3 technology	• Dynamically controlled voltage, frequency and power based on device activity, modes of operation and temperature
Low Power audio	• Provides up to 140+ hours of CD-quality audio playback
High-bandwidth memory interface with 8.5 GB/s	• OMAP5430 – 2-channel LPDDR2 @532 MHz • OMAP5432 – 2-channel DDR3 @532 MHz
Flexible system support	• Supports up to 4 displays: three high-resolution LCD displays and external HDMI 1.4a HDTV output • Enhanced, higher-speed industry-standard interfaces: USB3, MIPI CSI-3/UniPort-M/LLI
Backwards compatibility	• Begin development with the OMAP 4 platform and migrate easily later to the OMAP 5 platform

Best-in-class applications processor platform overview

At the heart of the OMAP 5 platform is a powerful system-on-chip that includes the perfect balance of power efficiency and high performance. The OMAP 5 processor balances processing across multiple engines:

- A programmable multimedia engine based on TI's mini-C64x DSP and power-efficient, multi-format hardware accelerators;
- On-demand general-purpose processing based on multiple ARM cores (two Cortex-A15 MPCores capable of running up to 2 GHz each and two Cortex-M4 cores) supporting symmetric multiprocessing (SMP)
- Multiple high-performance programmable graphics engines for the highest quality video with more codec choices
- An Image Signal Processor (ISP) for unparalleled video and imaging performance for both 2D and stereoscopic 3D (S3D).

The family includes two applications processors with package sizes and features designed for space-sensitive smartphone/tablet and cost-sensitive computing/consumer designs. The OMAP5430 offers a smaller 14x14 mm2 package with PoP LPDDR2

memory, while the OMAP5432 offers a 17x17 mm2 package with non-PoP DDR3 memory. Both processors offer the full variety of subsystems and applications discussed below to deliver a transformed user experience with hardware and software system solutions that scale across customer roadmaps optimizing time to market, flexibility and R&D efficiency.

### ARM Cortex-A15 leadership

TI is the first company to bring ARM's Cortex-A15 MPcore to market, offering a significant performance improvement and more capabilities versus the previous Cortex-A9 core. Developed in 28nm process technology, the Cortex-A15 raises the bar for high performance, energy-efficient computing delivering a 1.5x improvement in single-thread performance and a 1.6x improvement in floating point and media performance.

The Cortex-A15 MPCore supports SMP parallel processing for high performance and efficiency to deliver next-generation applications. SMP allows identical processing subsystems to run the same instruction set; have equal access to memory, I/Os and external interrupts; and run a single copy of the operating system to control all the cores.

Its scalable performance activates only the cores that are needed for that particular process to reduce power consumption or substantially increase performance. The Cortex-A15 processor also offers hardware virtualization support, opening up a significant opportunity for power and performance-efficient, multiple guest operating system (OS) support.

Power management

The OMAP 5 platform makes extensive use of TI's SmartReflex™ 3 power and performance management technologies, which include a broad range of intelligent and adaptive hardware and software techniques that dynamically control voltage, frequency and power based on device activity, modes of operation and temperature. This technology minimizes chip-level leakage power dissipation at 28 nanometers allowing devices to have ultra-low active and standby current drain, thereby increasing battery life. SmartReflex 3 technologies help enable the OMAP 5 platform to deliver the same performance as OMAP 4 with a nearly 60 percent power reduction, a significant savings.
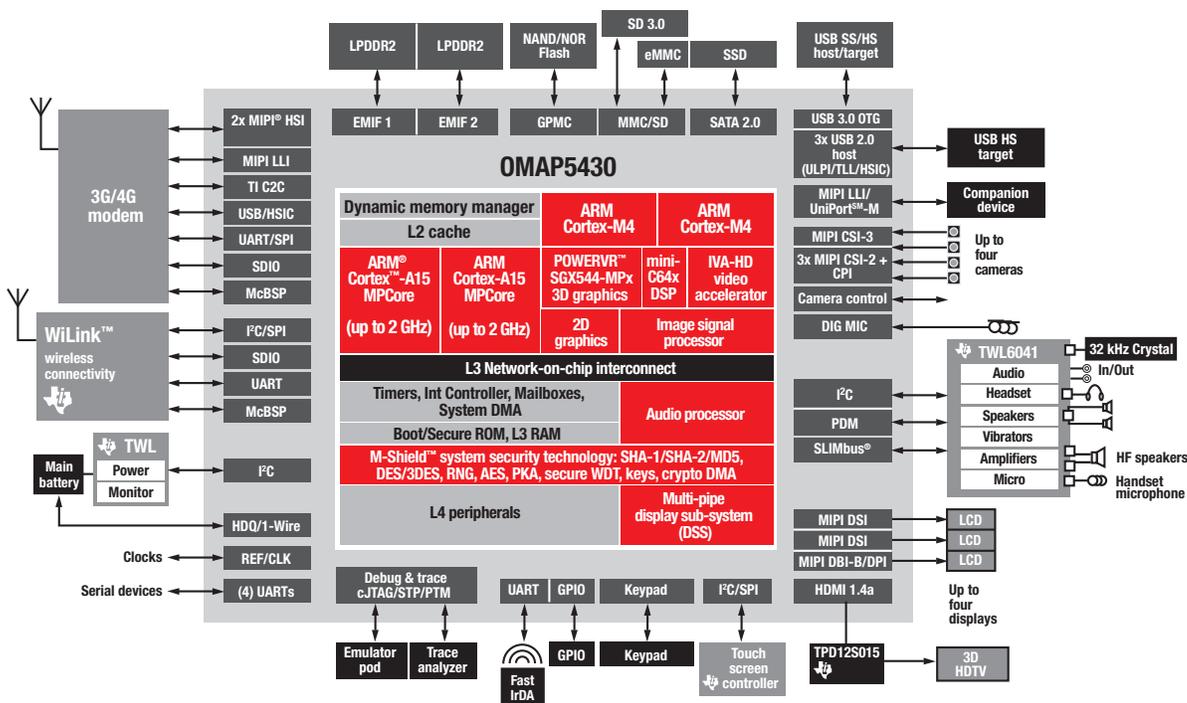
▲ *OMAP5430 block diagram*

Premium security

TI's M-Shield™ mobile security technology enables robust protection of enterprise data and premium copyrighted digital media content, secure protocol applications and e-commerce applications such as ticketing, banking, brokering and shopping. The OMAP 5 platform security offering is based on open APIs and provides an environment for secure applications that deliver robust performance, interoperability, greater development speed and large economies of scale.

As the advanced hardware and software security framework for the OMAP 5 platform, M-Shield technology enables value-added services and increased terminal security, allowing operators, content providers and manufacturers to secure sensitive assets and usage rights for protection against revenue loss.

Features include secure flashing and booting, so that only authorized software can be loaded on the handset, terminal identity protection that makes stolen phones useless, and network lock protection that prevents users from arbitrarily switching networks on the Web.

Complete systems expertise

TI's pre-integrated, proven wireless connectivity solutions ensure multi-mode operation and access to a variety of wireless network connections for service anytime and anywhere on a variety of wireless networks. TI's highly integrated WiLink™ single-chip connectivity solution (*Bluetooth*, Wi-Fi, GPS and FM) give manufacturers a distinct competitive advantage.

Additionally, TI offers a broad portfolio of complementary hardware solutions optimized for the OMAP 5 platform, including: DLP® Pico projection technology, analog components, embedded processors and logic solutions.

In-depth development support

The OMAP 5 platform is backed by TI's extensive development support. Code compatibility with other OMAP processors makes it easy to port software and a sophisticated development environment speeds programming for all on-chip processors.

In addition, the OMAP 5 platform is supported by the OMAP ecosystem, comprised of the OMAP Developers Network and OMAP Technology Centers (OTCs), as well as systems integrators, development tool providers and leading content providers worldwide. The OTC program has been extended to include support for TI's WiLink technology and connectivity solutions.

TI's OTC program provides a system-level approach with support for the OMAP platform and non-cellular wireless solutions to give handset manufacturers and developers access to a broad range of wireless systems expertise.

Information about the independent OMAP Technology Centers (OTCs), TI's extensive network of specialized system integrators skilled in all aspects of HLOS porting and integration is available at www.ti.com/wireless.

Transformed mobile experiences

The OMAP 5 platform is the best-in-class applications processor platform that delivers unique mobile experiences only possible with the OMAP 5 platform's unique design. The table below gives some examples of the unique, exciting mobile experiences possible with the OMAP 5 platform.

Mobile Experience	OMAP™ 5 Technology Enablers
True mobile computing • content creation • multiple OS support • desktop experiences	ARM® Cortex™-A15 processors with industry-leading performance, larger memory and hardware virtualization, 2D and multi-core 3D graphics acceleration, dual, high-bandwidth memory channels and multiple, high-resolution displays support.
Computational photography • enhanced images/video • new camera capabilities • embedded vision	Programmable imaging and video processors, stabilization hardware, stereoscopic 3D optimizations, hardware face detection and four simultaneous cameras
Natural user interface (NUI) • stereoscopic 3D • gesture control • interactive projection	Stereoscopic 3D optimizations, wide spectrum of processing engines (DSP, image accelerators, ARM NEON™ SIMD, multi-core GPU), DLP® Pico projection support and software APIs

For more information

To learn more about the OMAP 5 platform, including the OMAP5430 and OMAP5432 platforms, or about other OMAP applications processors from TI, visit www.ti.com/omap5-pb.

Processor family comparison

	OMAP5430	OMAP5432
Target Markets	Area-sensitive (Smartphones, Tablets)	Cost-sensitive (mobile computing, consumer)
Process node	28 nanometer low-power process	
ARM® Cortex™ processors	Two ARM Cortex-A15 (up to 2 GHz) Two ARM Cortex-M4	
2D & 3D Graphics	Multi-core, hardware accelerated	
Video performance (2D)	1080p60 multi-standard	
Video Performance (3D)	1080p30 multi-standard	
Imaging Performance	Up to 24 MP	Up to 20MP
Memory Support	(MIPI® CSI-3+ 3x MIPI® CSI-2+ CPI interfaces)	(3x CSI-2+ CPI interfaces)
Peripheral Support	2xLPDDR2	2xDDR3/DDR3L
Package	UART (6x), HSIC (3x), SPI (4x), MIPI® UniPortSM-M, MIPI® LLI, HSI (2x)	UART (5x), HSIC (2x), SPI (3x) MIPI® UniPortSM-M, MIPI® LLI, HSI

Availability disclaimer: The OMAP 5 platforms are intended for high-volume OEMs and ODMs and are not available through distributors. If your company meets this description, please contact your TI sales representative.

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