

OMAP™ 2 Architecture: OMAP2420 Processor

All-in-One Entertainment Architecture



Key Features

- 90-nm CMOS process for maximum system performance
- Unique, modular multi-engine architecture
- ARM11 architecture from 330 MHz to 1 GHz
- TI DSP-based audio and video, imaging, and industry leading graphics accelerators
- Software compatible with all OMAP processors
- Supports all major air interface standards and operating systems
- Full, built-in hardware security platform

PRODUCT BULLETIN

Overview

By coupling Texas Instrument's (TI) 15 years of success in the wireless market with TI's long standing expertise in signal processing for consumer electronics, the OMAP 2 architecture builds upon the benefits and features of the market leading first generation OMAP platform. The OMAP 2 architecture provides a foundation for mobile device manufacturers to merge today's most compelling high-end consumer electronics in an "All-in-One" smartphone or converged portable multimedia device.

State-of-the-Art Mobile Experience

The modular OMAP 2 multi-engine architecture includes a broad set of semiconductor technologies, accelerators, software, high-performance system interconnects and industry-standard interface peripherals to offer flexibility in one wireless integration platform to reach all market opportunities.

The OMAP 2 architecture is designed to redefine mobile entertainment and communications by delivering consumer electronics-quality user experience to the wireless industry.

- 6+ Megapixel cameras
- DVD-quality video
- High-end gaming console functionality
- Hi-Fi music with 3D sound effects
- Digital TV
- Best-in-class color display
- 3D graphics rendering up to 2 million polygons per second
- High-speed wireless connectivity

Multiple Engines for Parallel Processing

The OMAP 2 architecture gives users the ability to instantly run applications and operate multiple functions simultaneously without compromising quality of service. The modular engine processors are each optimized to support a specific function such as video/imaging, audio and 3D graphics, thus delivering highly responsive performance. The multiple engines can run concurrently with no degradation leaving the ARM to provide a smooth and responsive user interface.

Robust software infrastructure

TI's OMAP 2 architecture extends and builds on the software infrastructure of OMAP processors, allowing new capabilities to be added, while enabling reuse of existing software and allowing access to the broad range of software developed by the OMAP ecosystem. This compatibility with OMAP processors to the OMAP 2 architecture makes it an ideal choice for expanding or migrating existing lines to more feature-rich multimedia devices demanded by today's consumers.

TI's open, comprehensive software infrastructure supports C/C++ and other high-level programming languages, third-party applications, multimedia components and a host of development tools for each OS. TI and its ecosystem partners offer a range of optimized, standards-based application software and codec solutions. Some codecs include: MPEG-4, H.263, H.264, MP3, WMV and AAC. To speed development, TI provides world-class support through Wireless Application Centers and Independent OMAP Technology Centers offering crucial system integration, design, development and support for OMAP processor development.

Multi-Engine Processor

Simultaneous Parallel Processing



ARM



DSP



3D Graphics Engine



Video/Imaging Accelerator



Digital Baseband

Features

- Dedicated processor engines for specific tasks
- No degradation in quality of service
- Highly responsive
- Flicker-free video and click-free audio during multitasking

OMAP 2 Ecosystem

Symbian OS™
Linux®
PalmSource®
Windows Mobile™
Java™

Software and Tools

- Optimized and proven OS ports
- Reference Board Support Packages
- Device driver libraries
- Industry-standard development tools
- OMAP Developer Network
- Independent OMAP Technology Centers

Maximum Battery Life, Superior Performance

To complete the OMAP 2 system, TI offers System Power Managers for maximum battery life and overall system efficiency and performance. The System Power Manager enables brilliant multimedia performance on demand without compromising standby and talk time capacity.

- Delivers highly power efficient OMAP 2 system solution without performance compromises
- Highly efficient voltage regulators
- Dynamic voltage management
- Low battery and thermal shutdown protection
- Combines power management circuitry and control logic into highly integrated single chip

Safeguards through Hardware-enhanced Security Features

TI continues to place emphasis on the security measures necessary for the deployment of wireless services by offering security features in all OMAP 2 processors. Hardware embedded security enables accelerated cryptography to save power for VPN sessions and minimize processor burdens while ensuring fast security services and strong protection that lays the foundation for DRM and data protection.

Secure Flash and Boot

- Only authorized software can be loaded on the handset
- Digital signatures allow OEM to limit reprogrammable software on handset
- Signature is rechecked periodically and during boot

IMEI Protection

- Makes it unprofitable to alter identity of stolen phones
- Secret key protected in hardware allows OEM to "bind" one IMEI to each phone — phone will not function if IMEI is changed
- Equipment Identity Registers (EIR) to ban stolen phones become effective

SIMLock

- Replaces today's SIMLock strategies with a secure version that users cannot simply unlock the phone using instructions from the internet
- Restricts phone for use only on designated operator network

Optimized Power Management

System Power Manager, companion to OMAP 2 processors



Features

- Efficient system solution reduces external components
- Dynamic voltage management
- Low battery and thermal shutdown protection

OMAP 2 Processor Security

Hardware-Enhanced Security



Features

- Ideal DRM platform
- Secure flash and boot
- IMEI protection
- Improved SIMLock

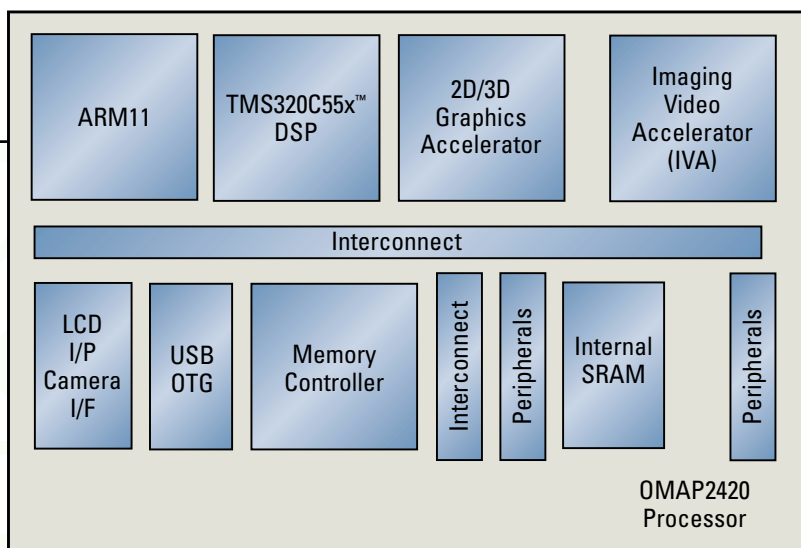
Specifications

OMAP2420 Processor

- ARM1136 at 330 MHz
- TMS320C55x™ DSP at 220 MHz
- 2D/3D hardware MBX/VGP accelerators, up to 2 Million polygons/sec
- Cross-bar high-speed, low-latency interconnect
- LCD and camera interfaces
- 32/32 KB caches
- Integrated memory controllers
- Complete peripheral set
- Hardware security platform
- Hardware accelerated camera and LCD interfaces
- Integrated memory controllers supporting Mobile DDR memories
- Imaging and Video Accelerator:
 - Boosts still pictures > 4 Mpixels
 - Full motion video encoding or decoding at rates up to 30 frames per second
 - Up to VGA resolution
- 5 Mbit internal SRAM supporting a VGA display
- Video out supporting an external TV display
- 325 ball, 12 mm x 12 mm package
- DDR system in package memory stacking (512 Mb and 768 Mb options)

TWL92230 Power Manager

- Interface signals to manage monitoring, operation controlling, regulator voltage setting changes
- Low current standby modes
- DC/DC step down converters
- LDO regulators
- Back-up battery switch
- 32-KHz oscillator and integrated RTC
- 400 KHz I²C compatible serial interface
- Dual slot MMC/SD/SDIO transceivers – powered independently
- GPIO ports
- Thermal shutdown protection and low battery detector
- Support for video DAC (VREF, VREG)
- 5 mm x 5 mm package



TWL92230
Power
Manager,
Companion
to OMAP2420
Processor



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Printed in U.S.A. by Millet the Printer Inc., Dallas, Texas
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B011905

SWPT010A