Fact Sheet
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Texas Instruments Multicore Fact Sheet

Overview:

TI multicore devices simplify the process of implementing multicore application-specific solutions by offering the tool set and supporting application know how that customers need to win in their markets.

- Customers can access both optimized homogeneous and heterogeneous architectures across a wide variety of end equipments that's supported by software, development environments, hardware tools and application knowledge
- Customers can improve system efficiency and performance while reducing the development complexity often associated with multicore implementations
- Customers will continue to save time to market and reduce their risk when implementing multicore solutions from TI by leveraging its ten plus years of experience, leading silicon and partnerships

What is a Multicore Device?

A multicore device has more than one programmable processor on the same silicon die. This can be either homogeneous with two or more of the same core, or heterogeneous with two or more different cores on the same die.

Homogeneous solutions may either be synchronous in that the cores are running exactly the same code at the same time or asynchronous in that they are running different portions of the code at the same time.

TI Multicore Solutions:

TI offers several multicore architectures across a variety of product families, including TMS320™ DSPs, DaVinci™, MCUs, and OMAP™ technologies. These architectures span a wide variety of applications including automotive, industrial, medical, communications infrastructure, video, and wireless handsets.

TMS320™ Multicore DSPs

- TMS320VC5420/21: Two independent TMS320C54x™ DSP cores capable of core-to-core communications targeted for telecom applications. Processors provide one program

memory bus, three data memory buses, arithmetic logic unit (ALU) for high degree of parallelism, application-specific hardware logic, on-chip memory, and additional on-chip peripherals.

- TMS320VC5441: Quad core with four TMS320C54x™ DSPs with shared program memory targeted for telecom applications. The C5441 is a high-performance, low-cost, high-density DSP for remote data access or voice-over IP subsystems. It is designed to maintain the current modem architecture with minimal hardware and software impacts, thus maximizing reuse of existing modem technologies and development efforts.
- TMS320VC5470/71: Dual core with a TMS320C54x DSP and an ARM7TDMI RISC MCU targeted for IP phones. The DSP subsystem includes 72K × 16-bit SRAM, a timer, a DMA controller, an external memory interface, and two McBSPs. The MCU subsystem includes three timers, general-purpose I/O, and an external memory interface.

DaVinci™ Multicore DSPs

- TMS320DM644x: These DSPs are based on an ARM926 processor and the TMS320C64x+ DSP core. These devices (DM6446, DM6443 and DM6441) are targeted for applications such as videophones, automotive infotainment, digital still cameras, streaming media, IP set-top box. The complete DaVinci software infrastructure, from low-level OS drivers to application APIs, makes it possible for developers to implement digital video without having to focus resources on writing and optimizing codecs or programming a DSP.

Multicore MCUs

- MSP430: This industry-leading ultra-low-power MCUs are used a variety of industrial and consumer applications. The heterogeneous MSP430FE42x devices target electrical energy metering with an embedded signal processing (ESP) core along with the 16-bit MSP430 core.
- TMS570: These industry first homogeneous Cortex™ ARM® R4-based MCUs target safety-critical automotive applications with a patent pending implementation of the lock step cores.

Multicore OMAP™

- OMAP5910: Dual-core architecture with a TMS320C55x™ DSP core and a TI925 ARM core to meet the application processing needs of embedded devices. Targeted at mobile communications, video products (that need MPEG-4, JPEG, Windows® Media Video, graphics and video accelerators), advanced speech applications, audio processing applications (that need MPEG-1 Audio Layer3 [MP3], AMR, WMA, AAC, and other GSM speech codecs), and data processing applications for fax, encryption/decryption, authentication, signature verification and watermarking.
- OMAP5912: Dual-core architecture with a TMS320C55x DSP core and an ARM926EJ-S ARM core. Targeted at mobile communications, video products (that need MPEG-4, JPEG, Windows® Media Video, graphics and video accelerators), advanced speech applications, audio processing applications (that need MPEG-1 Audio Layer3 [MP3], AMR, WMA, AAC, and other GSM speech codecs), and data processing applications.

  - These devices are designed to run leading open and embedded RISC-based operating systems, and TI DSP/BIOS™ software kernel foundation.
- OMAP2: Based on TI's enhanced OMAP™ 2 multi-engine parallel-processing architecture and high-performance / low-leakage 90-nm CMOS process technology, the OMAP2430 / OMAP2431 provide the ultimate balance between multimedia performance, flexibility, power and cost.

Multicore Shipments

Customers have been shipping products that have contained over one billion TI multicore devices over the past ten years. TI's manufacturing knowledge and both external and internal resources allows.

Helping Customers Win in Their Markets

Unlike other multicore providers, customers can leverage the best technology available for the specific applications along with the many tools TI employs to meet specific applications requirements like power, performance and space requirements.

Automotive

- To improve customer safety, Bosch, the leading automotive OEM, chose TI to develop the first homogenous MCU for safety critical applications. Running in a synchronous mode the TMS570 device was the first to achieve IEC 61508 compliance, the highest level of safety and reliability for automotive applications.
- By using the TMS570 processor, developers of safety-critical automotive applications greatly reduce the software development time, board space and EMI through the elimination of additional MCUs.

Communications Infrastructure

- According to iSuppli, TI has 90% marketshare for both 3G and 2G wireless base stations, as well as leadership positions in emerging 4G standards such as WiMAX and LTE.
- The TCI6487 high-performance DSP has three independent DSP subsystems. At the heart of each subsystem is a 1.0-GHz C64x+ DSP core. The TNETV3020 processor targets high-density core networking applications with six high-performance DSPs with dedicated blocks for Level 1 data and instruction cache, as well as Level 2 cache, along with shared memory. This combination makes the TNET device ideal for H.263, MPEG-4 and CIF functions for video, and also helps expands voice codec channels.

Video

- Enabling customers to develop innovative video applications DaVinci technology "is clearly a landmark in consumer electronics," according to Chris Crotty, senior consumer electronics analyst, iSuppli.
- The TMS320DM6446 processor combines an ARM926 core—ideally suited for handling host control—with a leading TMS320C64x+™ DSP for video processing, analytics and other intensive applications. Customers have reported that the DM6446 processor results in a 30% BOM reduction when compared to a discrete solution.

Wireless Handsets

- TI is the number one supplier for wireless applications processors which includes mobile phones and converged devices (Source: IDC, June 2007)
- The OMAP3430 is the first applications processor in the industry to integrate the ARM® Cortex™-A8 superscalar microprocessor core. Combined with TI's technology in the OMAP3430, the ARM Cortex-A8 enables faster user interfaces, faster data access and boosts productivity and entertainment applications on the mobile phone, while maintaining power efficiencies expected in a handset.

Industrial

- According to the Embedded Processing Survey conducted by CMP, the MSP430 MCU consistently makes the list of most preferred 16-bit MCUs available
- With high integration for SoC functionality and industry leading low power the dual-core MSP430 series of MCUs enable a five-to-one reduction in system components for sensing applications like e-metering and can save up to 30% of lost power associated with typical mechanical meters.

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Mailing Address: Texas Instruments, Post Office Box 655303, Dallas, Texas 75265
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