## Product Bulletin

# TMS320C6411 Fixed-Point DSP

**Key Benefits**
- Delivers C64x™ performance levels to applications that require high performance but are power- and cost-sensitive
- Tight coupling of the CPU architecture and compiler maximizes processor through-put while speeding development time
- Accelerates time-to-market with a comprehensive development environment and world-class third-party support

The TMS320C64x™ generation of fixed-point DSPs from Texas Instruments offers the highest level of performance to address the demands of the digital age. At clock rates of 600 MHz and greater, C64x™ DSPs can process information at a rate of more than 4800 millions of instructions per second (MIPS), or nearly five billion instructions per second. In addition to a high clock rate, C64x DSPs can do more work each cycle with built-in extensions to TI's original TMS320C62x™ high-performance fixed-point architecture. These extensions include new instructions to accelerate performance in key application areas such as digital communications infrastructure and video and image processing.

### TMS320C6411 DSP — Expanding the Platform

Now, TI is extending the high-performance capabilities of the C64x DSP generation to even more applications with the new TMS320C6411. With more Millions of Multiply Accumulates

(MMACS) per dollar and per Watt than any other DSP in its class, the C6411 DSP makes the C64x generation's industry-leading performance available to a variety of lower-power, lower-cost applications, including residential media

servers, security/surveillance systems, telecom/datacom systems and hardcopy appliances.

The C6411 DSP is the lowest power DSP in its class, with a 250-mW core at 1.0 V. The C6411 DSP

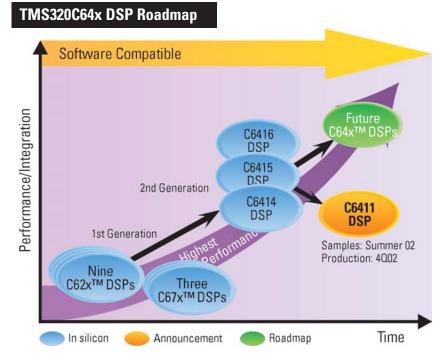## TMS320C64x DSP Roadmap



*Figure 1. The C6000™ DSP platform offers a wide range of performance/integration options. The C6411 DSP expands second-generation C6000 DSP platform in low-cost, lower power, high-performance embedded applications.*
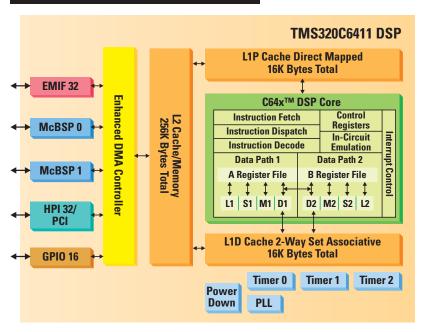
## TMS320C6411 DSP Block Diagram



*Figure 2.*

delivers 300 MHz/2400 MIPS and 1200 MMACS of performance. As the lowest cost C64x DSP, the C6411 DSP is ideal for price sensitive applications that still require high performance, programmability and high energy efficiency. In addition to an industry-leading core, the C6411 DSP features some differentiating peripherals, including:

- A 64-channel Enhanced Direct Memory Access (EDMA) for superior input/output (I/O) efficiency
- A 32-bit External Memory Interface (EMIF) for high-bandwidth to memory
- Two Multi-channel Buffered Serial Ports (McBSPs) for easy audio and telecom interfacing
- Three 32-bit timers, two with the ability to count external events

- An HPI 32/33-MHz PCI to simplify host connectivity
- A 16-bit general-purpose I/O pins that designers can

program to generate different CPU interrupts and EDMA events

### Building on the TMS320C6000™ DSP Platform Legacy – A Roadmap for Success

The C6411 DSP serves as a low-cost entry point to the high-performance C64x™ generation, allowing a range of applications to harness the architectural advantages of these DSPs. In addition, because all C6000™ DSPs are completely code compatible, the device provides a migration path for designers currently using C62x™ or C64x fixed-point DSPs. The C6000 platform also offers a high-performance C engine with a compiler that leverages the architecture to sustain maximum performance while speeding design development time for high-performance applications.

## TMS320C64x DSP Product Spectrum

| | Software Compatible | | | |
| --- | --- | --- | --- | --- |
| | C6411 | C6414 | C6415 | C6416 |
| Performance | 2400 MIPS | 4000/4800 MIPS | 4000/4800 MIPS | 4000/4800 MIPS |
| Memory (Bytes) | L1 Prog: 16K L1 Data: 16K L2 P/D: 256K | L1 Prog: 16K L1 Data: 16K L2 P/D: 1M | L1 Prog: 16K L1 Data: 16K L2 P/D: 1M | L1 Prog: 16K L1 Data: 16K L2 P/D: 1M |
| Key Feature | HPI or PCI | HPI | PCI, UTOPIA 2 | VCP/TCP H/W Accelerators |
| BGA Package | 23 mm/532 | 23 mm/532 | 23 mm/532 | 23 mm/532 |
| Internal Power (Typ) | 0.25 W @ 300 MHz | 0.64/1.04 W @ 500/600 MHz | 0.64/1.04 W @ 500/600 MHz | 0.64/1.04 W @ 500/600 MHz |
| 10 KU Price (Estimated) | $39.00 | $89.99/ $110.99 | $98.99/ $134.99 | $108.99/ $149.99 |
| Samples | Sept. 2002 | Now | Now | Now |
| Production | 4Q02 | 4Q02 | 4Q02 | 4Q02 |

*Figure 3. The C64x DSP generation offers engineers the flexibility to choose peripherals to fit their application needs at different power and cost levels.*

## World-Class Development Support

In addition to industry-leading performance, C6411 DSP customers can speed products to market with access to the world's most complete portfolio of hardware, software and third-party design resources. TI supports the C6411 DSP with eXpressDSP™ software and development tools, including the Code Composer Studio™ Development Tools and the DSP/BIOS™ real-time kernel.

The C6416 DSP Test and Evaluation Board (TEB), which is fully code compatible with the C6411 DSP, allows designers to get started immediately with value-added features and hardware components designed to enable rapid development and quick time-to-market.

Finally, the C6411 DSP comes with full support from the industry's largest third-party DSP network. With a host of hardware and software solutions, the network offers unparalleled support in

speeding the most advanced designs to market.

## Pricing and Availability

The C6411 DSP is scheduled for sampling in 3Q 2002, with full production in 4Q 2002. Current prices in 10K-unit quantities are U.S. $39 each. The C6416 TEB is

available now, and customers can get more information on pricing and kit contents by visiting TI's online store. For more information about the C6411 DSP, visit our website at **www.dspvillage.ti.com/silicon6411m** or contact your local TI field sales office.

*Additional technical documentation*

| | |
|---|---|
| TMS320C64x Technical Overview | SPRU395 |
| TMS320C6000 CPU and Instruction Set Reference Guide | SPRU189 |
| TMS320C6000 Peripherals Reference Guide | SPRU190 |
| TMS320C6000 Optimizing C Compiler User's Guide | SPRU187 |
| TMS320C6000 Programmer's Guide | SPRU198 |
| TMS320C64x DSP Library Programmer's Reference | SPRU565 |
| TMS320C64x DSP Image/Video Processing Library Programmer's Reference | SPRU023 |

*Start designing now with the:*

| Description | Part Number | Pricing ($U.S.) | Purchase |
|---|---|---|---|
| TMS320C6416 Test and Evaluation Board (TEB) | TMDX3260C6416 | 1,995 | BUY ONLINE ▶ |
| C6416 TEB Bundle including full Code Composer Studio™ Development Tools and the XDS510PP-Plus | TMDX3260E6416 | 3,995 | BUY ONLINE ▶ |

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