

**Product Bulletin**

# TMS320C5470 and TMS320C5471 System-Level DSPs

**Key Benefits**

- Reduces system size, cost and power 40 percent compared to discrete RISC + DSP embedded systems
- Enables DSP performance in RISC-based systems, while allowing optimized task partitioning for increased system performance
- Accelerates time-to-market with rich peripheral set and OS communication stack availability

In volume production today, the TMS320C5470 and TMS320C5471 system-level DSPs and accompanying application software and development tools give designers an immediate way of reducing system size, cost and power consumption for real-time applications. The devices combine the real-time processing power of a TMS320C54x™ DSP core, an ARM7 THUMB® reduced-instruction-set-computing (RISC) processor, and support by the most requested embedded operating systems on the market today.

With the devices' integration of the DSP + RISC on a single chip, plus a robust peripheral set, designers can realize a 40 percent reduction in system size, power and cost compared to discrete RISC + DSP implementations. These devices also bring DSP-enabled performance to low-cost RISC-based systems without penalty or need to upgrade to more expensive RISC architectures. In addition, designers can greatly accelerate time-to-market by leveraging the wealth of IP available for the C5470 and C5471 DSPs.

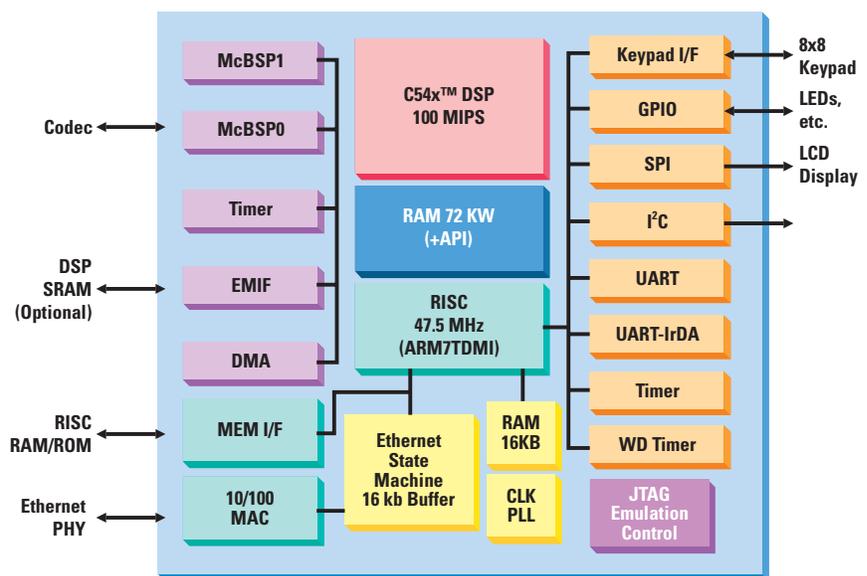
The performance of the architecture, utility of the peripheral set and the attractive cost of the system-level DSPs, allows for a broad base of applications. A few real-time application examples include:

- Text-to-speech
- Wireless data
- Voice recognition
- Networked security

**Integration Enables Fast, Robust System Development**

Through high levels of integration and intelligent partitioning of DSP and RISC functions, the C5470 and C5471 DSPs eliminate the need for expensive and power-hungry discrete RISC processors often required to perform both real-time tasks and control functions. The heterogeneous

**TMS320C5471 DSP Block Diagram**



The TMS320VC5471 DSP has all the features of the C5470 DSP with the addition of a 10/100 Base-T Ethernet MAC for easy LAN connection.

## DSP Subsystems Feature Flexibility

### DSP Subsystem

- Comprised of the C54x DSP core which operates at up to 100 MHz and has 72 KW of RAM.

#### Peripherals include:

- Two Multi-channel Buffered Serial Ports (McBSPs),
- Six-channel direct memory access (DMA) controller,
- Programmable phase-locked loop (PLL),
- External memory interface (EMIF),
- DSP interrupt handler, and
- A software-programmable hardware timer.

### ARM-Side Peripherals

- Two universal asynchronous receiver/transmitters (UARTs),
- Serial port interface,
- 36 general-purpose I/O,
- Memory interface,
- I<sup>2</sup>C interface, and
- Three timers (two general-purpose timers and one watchdog timer).

In addition to this comprehensive feature set, the C5471 DSP adds

- A 10/100 Base-T Ethernet MAC for easy LAN connection.

dual-core architecture allows optimized task partitioning for increased system performance using the right processor for the right task. With these devices, the C54x<sup>TM</sup> DSP core performs real-time functions such as encoding, echo cancellation and speech synthesis, while the ARM7 core performs human interface and command and control functions such as dictionary and table look up.

Both the C5470 and C5471 DSPs are based on two distinct subsystems—a DSP subsystem with its dedicated peripherals, and a RISC subsystem with its dedicated peripherals.

Communication between the DSP and the RISC is facilitated by ARM<sup>®</sup> Port Interface (API). The RISC subsystem is based on the ARM7 which is a 32-/16-bit RISC which operates at up to 47.5 MHz and has 16 KBytes of integrated zero-wait-state synchronous RAM (SRAM).

This rich array of communications peripherals allows designers to rapidly bring new products to market. Designers can also take advantage of the time-to-market benefit by leveraging the wealth of IP available for the C5470 and C5471 DSPs.

The C5000<sup>TM</sup> DSP platform supports over 400 TMS320<sup>TM</sup> DSP Algorithm Standard (xDAIS) compatible algorithms coupled with the DSPLinux, VxWorks<sup>TM</sup>, and Nucleus<sup>TM</sup> OS support providing over 1,000 middleware components and communications stacks supporting such protocols as 10/100 Ethernet, HPNA, Bluetooth and 802.11b Wireless LAN.

## Development Support Speeds Design Process

TI complements the C5470 and C5471 system-level DSPs with an equally integrated and complete development environment. Development resources are avail-

able today to allow designers to get started immediately with system design.

- TI's Code Composer Studio<sup>TM</sup> Development Tools version 2.0 for OMAP provides full heterogeneous code development and debug for the ARM7 and TMS320C54x<sup>TM</sup> DSP generation.
- C5470/C5471 Evaluation Modules (EVMs) are available from Spectrum Digital, a TI Third Party. These EVMs contain full JTAG emulation and offer a robust development hardware target for accelerated test and debug of customers' applications.

- Also available from Spectrum Digital is a bundled DSPLinux<sup>TM</sup> C5471 EVM package with the RidgeRun<sup>TM</sup> DSPLinux development and Operating System Platform, Board Support Package (BSP), and integrated emulation. Customers can take advantage of this integration bundle for a fully integrated out-of-the-box full development tool chain

In addition to these development resources, C5470/C5471 board support packages from WindRiver (VxWorks) and Accelerated Technologies (Nucleus) will be available in 2002.

## Pricing and Availability

The TMS320C5470 and TMS320C5471 DSPs are available today in production quantities. The C5470 DSP is priced at U.S. \$12.00 and the C5471 DSP at U.S. \$13.00 in 10 KU quantities. The C5470/C5471 evaluation module

**Start designing now with the:**

Description	Part Number	Pricing (\$U.S.)	Purchase
<a href="#">Code Composer Studio™ IDE v2 for the OMAP platform</a>	TMSMP4M85C-07	4,500	<a href="#">BUY NOW ▶</a>
<a href="#">C5471 DSP Development Bundle</a>	701791	8,999	<a href="#">BUY NOW ▶</a>
<a href="#">DSPLinux™ Software Development Package</a>	761798	7,499	<a href="#">BUY NOW ▶</a>

bundled with RidgeRun's DSPLinux is available from Spectrum Digital ([www.spectrumdigital.com](http://www.spectrumdigital.com)).

For complete product details, visit our website at: [www.dspvillage.ti.com/silicon5470](http://www.dspvillage.ti.com/silicon5470) or contact your local TI field sales office.

**For detailed information, download the:**

- [TMS320VC5470 Fixed-Point Digital Signal Processor Data Manual](#)
- [TMS320VC5471 Fixed-Point Digital Signal Processor Data Manual](#)
- [Using Boundary Scan on the TMS320VC5471/VC5470 DSPs Application Note](#)
- [TMS320VC5471/TMS320VC5470 Development Board Solutions](#)

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