TMS320C5514 and TMS320C5515 DSPs

Industry's lowest power 16-bit DSPs

Maximize battery life with TMS320C5514/15 DSPs

Combining industry-leading, cutting-edge 90-nm process technology with low-leakage transistor technology, the new TMS320C5515 and TMS320C5514 DSPs offer the industry's lowest standby power consumption (<150 µW) at the industry's lowest active power consumption (<0.15 mW/MHz) for performance up to 120 MHz – maximizing energy efficiency and extending battery life for portable devices. These pin-to-pin compatible processors provide a high level of integration reducing overall system cost and enabling extensive end product differentiation. These devices also offer feature and cost flexibility to support different application requirements including portable voice/audio (i.e., voice recorders, noise-cancellation headphones, musical instruments), portable medical (i.e., electrocardiogram, pulse oximeter, digital stethoscope and multi-parameter patient monitors), biometrics, smart sensors, software-defined radios and telephony.

The improved power management available on these devices combined with multiple additional power-down states, dynamic frequency, voltage scaling, clock gating, the freedom to turn on and off individual peripherals and other power-saving architectural features found on C5515 and C5514 DSPs allow for maximum battery life of several applications. Power consumption as low as 9 mW‡ at 60 MHz on C5514/15 processors greatly extends the portability of such products and allows designers to add more features without decreasing battery life. On-board FFT coprocessors further provide higher energy efficiency for FFT-intensive algorithms. There are three on-chip LDOs (Low Drop Out Regulators) in C5514/15 processors that reduce system-level BOM cost and simplify the power-management circuitry.

Reduce system power via high peripheral integration

C5515 and C5514 DSPs offer a variety of peripherals and interfaces. Designers can save significant system cost through peripheral integration such as USB 2.0 slave (high speed), SAR ADC, three on-chip LDOs, LCD controllers and several serial interfaces negating the need for external processors and logic. On-chip memory scalability options of up to 320 KB reduce the need for external memory in several applications, providing the most cost-efficient way to boost performance.

Key Features:

- Industry's best combination of standby (<0.15 mW) and active power (<0.15 mW/MHz)
- Large on-chip memory and optimized FFT coprocessor for faster, cost- and energy-efficient performance
- Extensive connectivity options and extensive peripheral support
- One-fourth the power consumption of existing TMS320C55x™ DSPs

The 10×10-mm, 0.65-mm pitch BGA package provides designers with a solution for more ergonomic designs and applications that have space constraints.

The C5515 and C5514 devices have full code and tool compatibility with existing TMS320C55x™ products to make it easy for designers to port their designs to the new devices. The low-power, 16-bit fixed-point TMS320C55x DSP core, flat memory architecture, FFT acceleration, DMA subsystem and dynamic power management functionality provide designers with a flexible, scalable platform to add extended battery life to any application. Devices start as low as U.S. $6.50 in 1 KU quantities.

‡ Power-use scenario – active: 1.3-V core (100 MHz) running at 75% DMAC + 25% ADD at 25°C

Technical details

TMS320C5514 DSP:

- Highly-integrated peripherals reduce system cost and enable more user-friendly portable features:
  - Three on-chip LDOs
  - High-speed USB 2.0
  - I^2S
  - UART
  - SPI
  - MMC/SD
  - GPIOs
- Up to 256 KB of on-chip memory saves both power and system cost by reducing the need for external memory

TMS320C5515 DSP:

- C5515 DSP builds on the C5514 DSP with an additional 64 KB on-chip memory (320 KB total)
- Up to 1024-point programmable FFT hardware accelerator
- Integrated LCD display controller and 10-bit, 4-channel SAR ADC – reduce system cost and enable more user-interactive portable features
- Scalable and pin-to-pin compatible with the C5514 DSP allowing for the ability to design an entire product portfolio using the same hardware and software platform

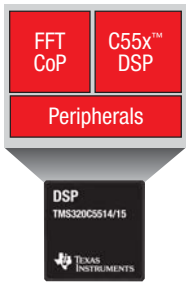
Applications

- Portable audio recording
- Wireless microphone
- Noise cancellation headphones
- Medical monitoring
- Biometrics
- Smart sensors

Get started quickly

To get started quickly, designers can purchase the C5515 Evaluation Module (C5515 EVM) with built-in emulation for U.S. $395. There is also a low-cost eZdsp™ USB stick development tool with built-in XDS100 emulation available for U.S. $79. All EVMs include full board support packages and the associated debugging environment. C5514/15 DSPs are supported by Code Composer Studio™ (CCStudio) integrated development environment.

For more information on TMS320C5514/15 DSPs, visit **www.ti.com/c5000**.



9 mW (60 MHz)†/22 mW (100 MHz)‡

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Product Information Centers

Americas	Phone	+1(972) 644-5580
Brazil	Phone	0800-891-2616
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	Internet/E-mail	support.ti.com/sc/pic/americas.htm

Europe, Middle East, and Africa

Phone

European Free Call	00800-ASK-TEXAS (00800 275 83927)
International	+49 (0) 8161 80 2121
Russian Support	+7 (4) 95 98 10 701

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Fax	+(49) (0) 8161 80 2045
Internet	support.ti.com/sc/pic/euro.htm

Japan

Phone	Domestic	0120-92-3326
Fax	International	+81-3-3344-5317
	Domestic	0120-81-0036
Internet/E-mail		
	International	support.ti.com/sc/pic/japan.htm
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Asia

Phone

International	+91-80-41381665
Domestic	Toll-Free Number
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Singapore	800-886-1028
Taiwan	0800-006800
Thailand	001-800-886-0010

Fax	+886-2-2378-6808
E-mail	tiasia@ti.com
	ti-china@ti.com
Internet	support.ti.com/sc/pic/asia.htm

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† Power-use scenario – active: 1.05-V core (60 MHz) running at 75% DMAC + 25% ADD at 25°C
‡ Power-use scenario – active: 1.3-V core (100 MHz) running at 75% DMAC + 25% ADD at 25°C