

# TMS320C550x Fixed-Point DSPs



## Maximize battery life with TMS320C550x DSPs

For applications requiring longer battery life, TI has extended its popular TMS320C5000™ low-power platform to even lower power levels with additional C550x devices. In addition to benefiting portable applications, the C550x processors operate at lower power levels to enable green, energy-efficient applications. These DSPs include large on-chip memory as well as an FFT co-processor for optimal performance. Applications such as medical monitoring, noise-cancellation headphones, wireless microphones and portable audio recording will benefit from the performance and peripherals of C550x DSPs.

With price points starting as low as U.S. \$9.95 in 100u quantities and incredibly low deep-sleep mode power of 6.8  $\mu$ W\*, new and existing C550x devices extend battery life to allow applications to stay powered while also

conserving energy. Power consumption as low as 46 mW† at 100 MHz on C550x processors greatly extends the portability of existing products and allows designers to add more features without decreasing battery life.

C550x DSPs offer a variety of peripherals and interfaces. Designers can add Bluetooth® functionality via an onboard hardware UART interface or WLAN via SPI or SDIO interfaces. The low-power, 16-bit TMS320C55x™ DSP core, flat memory architecture, DMA subsystem and dynamic power management (DPM) functionality provide designers with a flexible, scalable platform to add extended battery life to any application. The 10×10-mm BGA package provides designers with a solution for more ergonomic designs and applications that have space constraints. The C550x generation has full code and tool compatibility with existing TMS320C5000 products to make it easy for designers to port their designs to new devices. C550x devices give designers the power to add more features to existing battery-operated products, portability to traditionally wired applications, lower heat dissipation, save energy costs on wired applications or meet any other application requirements for a low-power processor.

## Increased battery life through TI advanced process technology

Combining industry-leading, cutting-edge 90-nm process technology with low-leakage transistor technology, the C550x generation of DSPs offers the industry's lowest standby power consumption. Improved power

### Key Features:

- Industry's lowest power fixed-point DSP
- Large on-chip memory and optimized FFT co-processor for faster, cost- and energy-efficient performance
- User friendly interface and more connectivity options with extensive peripheral support
- One-half the power consumption of existing TMS320C55x™ DSPs

management and deep-sleep mode 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 C550x DSPs allow for maximum battery life of applications they are used in. Designers can save significant system power through peripheral integration such as USB 2.0 slave (high speed), SAR ADC with touch-screen support, LDOs and LCD controllers, 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 some applications, providing the most cost-efficient way to boost performance. TI's advanced

\* Power-use scenario – deep sleep: Core voltage OFF (DSP OFF), all peripheral clocks OFF, RTC ON at 25°C  
† Power-use scenario – active: 1.3-V core (100 MHz) running at 75% DMAC + 25% ADD at 25°C

DSP

TMS320C550x



TEXAS  
INSTRUMENTS

## Technical details

### Architectural features

- Multiple power modes:
  - Deep-sleep mode from 6.8  $\mu$ W\*
  - Standby from 0.34 mW<sup>§</sup>
  - Active from 18<sup>†</sup>/46<sup>‡</sup> mW
- Up to 320 KB on-chip memory
- Portable power-tuned peripherals including USB 2.0 HS, LDO and touch-screen support
- High-performance 16-bit C55x™ DSP core

- Includes one FFT co-processor that supports up to 1024-point real- and complex-valued FFTs
- Code compatible with all existing C5000™ devices

### System integration

- Four independent DMAs with four channels each
- Connectivity: UARTs, USB 2.0, SDIO, SPI, I<sup>2</sup>S
- Integrated RTC clock allows implementation of clock and calendar functions
- Memory controller options provide a glueless connection to multiple banks

of external mSDRAM, NOR Flash, NAND Flash and SRAM

- 10×10-mm BGA package (commercial temperature and industrial range 0°C to 70°C or -40°C to 85°C)

### Applications

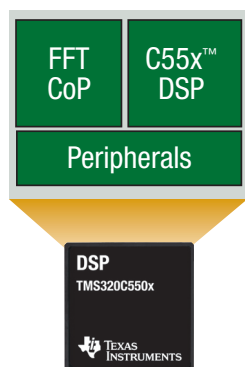
- Portable audio recording
- Wireless microphone
- Noise cancellation headphones
- Medical monitoring
- VoIP
- Biometrics

low-power technology found on C550x DSPs takes the next big leap towards smaller and more powerful embedded processors coupled with optimized, environmentally responsible technology to enable truly green products.

## Get started quickly

To get started quickly, designers can purchase C550x development kits with built-in emulation for less than \$500 USD. All kits include full board support packages and the associated debugging environment. C550x DSPs are supported by Code Composer Studio™ (CCStudio) integrated development environment.

For more information on TMS320C550x DSPs, visit [www.ti.com/c550x](http://www.ti.com/c550x).



6.8  $\mu$ W\*—18<sup>†</sup>/46<sup>‡</sup> mW

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\*Power-use scenario – deep sleep: Core voltage OFF (DSP OFF), all peripheral clocks OFF, RTC ON at 25°C

§ Power-use scenario – standby: 1.05-V core, DSP clock OFF, all peripheral clocks OFF, RTC ON at 25°C

† 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