Texas Instruments

TMS320C5504 & TMS320C5505 Digital Signal Processors – Industry's lowest-power 16-bit DSPs

TMS320C550x Evaluation Module

What products did TI launch on June 10, 2009?

TI announced the TMS320C5505 and TMS320C5504 digital signal processors (DSPs), which are the latest devices in the TMS320C550x generation, and the industry's lowest power 16-bit DSPs operating at lower power levels for energy-efficient portable applications requiring longer battery life. Additionally, the TMS320C5505 EVM, a fully-functional, feature-rich evaluation module (EVM), is announced in conjunction with the parts.

What applications do the processors target?

The processors are optimized for sophisticated portable devices that require low power and longer battery life, including portable voice/audio devices, noise-cancellation headphones, musical instruments, medical monitoring devices, biometrics and industrial instruments. Other applications that benefit from the C5505 and C5504 DSPs are software-defined radio, wireless microphones, telephony and audio cards.

What is the difference between the C5505 and C5504 DSPs?

Each processor is optimized to address the needs of manufacturers based on their specific requirements. The C5505 DSP is fully loaded with software, integrated peripherals, increased memory, an FFT hardware accelerator and an integrated power management LDO for increased functionality and more user-friendly features. The C5504 DSP is a lower-cost DSP with software compatibility, optimized memory and an integrated power management LDO that maximizes OEMs'/ODMs' investment.

What are the key features/benefits of the C5505 and C5504 DSPs?

TMS320C5505 DSP

- Standby power less than 150 µW and active power less than 0.15 mW/MHz
- Highly-integrated peripherals – including a programmable FFT hardware accelerator up to 1024 points, high-speed USB 2.0, LCD display, I^2S, UART, SPI, MMC/SD and GPIOs and 10-bit 4-channel SAR ADC – reduce system cost and enable more user-friendly portable features
- Scalable and pin-to-pin compatible with C5504 DSP low-power devices allows for the ability to design an entire product portfolio using the same hardware and software platform
- Up to 320 KB of on-chip memory saves both power and system cost by reducing the need for external memory

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- Scalable and pin-to-pin compatible with C5505 DSP low-power devices allows for the ability to design an entire product portfolio using the same hardware and software platform
- Up to 256 KB of on-chip memory saves both power and system cost by reducing the need for external memory

What are the key features/benefits of the C5505 EVM?

The EVM is fully functional with the ability to evaluate every aspect of the silicon. Embedded on-board emulation only requires an A-to-mini B USB cable to enable customers to perform debugging and development work. The EVM offers the ability to sample code to multiple applications and includes a wide range of software resources and documentation.

What is an FFT and how is it different from what other companies are offering?

An FFT is a Fast Fourier Transform hardware accelerator incorporated for faster, more power-efficient filtering. Though other companies offer an FFT on their processors, TI is offering a 1024-point programmable FFT, which is four to six times more energy efficient and two to four times more cycle efficient.

Is the C5505 EVM also compatible with the C5504 processor?

Yes, the C5505 EVM is fully compatible with the C5504 processor.

What benefits can end users experience from the C5505 and C5504 DSPs?

End users will realize an improvement in battery life of over 50 percent and lower system cost with user-friendly features on their portable devices.

What is the price of the C5505 and C5504 DSPs and C5505 EVM?

The C5505 DSP is priced at US $6.75 in quantities of 1,000 units (1 KU). The C5504 DSP is available for US $5.60 in quantities of 1,000 units. The C5505 EVM is available for US $395.00.

Are other TMS320C5000™ parts available or are these the first?

We have a portfolio of 34 existing parts. These two are the latest C5000™ DSPs.

In this announcement, you tout low power. How do these devices differ from other low-power devices from TI?

TI offers a suite of low-power devices from digital signal processors, digital media processors and microcontrollers to complementary analog parts. The key differentiating factors are cost – the C5505 and C5504 devices are the lowest power DSPs in our portfolio – and target applications that each is optimized for as. The C5505 and C5504 DSPs are designed for applications where active power and standby power are both key careabouts. Best-in-class combination of standby and active power provided by C5505 and C5504 DSPs of up to 100-MHz performance maximizes the battery life for several portable applications.

MSP430 is ideal for low-power applications that require performance up to 25 MHz. The C5505 and C5504 DSPs complement the MSP430 family by providing excellent power consumption for applications requiring performance up to 100 MHz. More specifically, C5505 and C5504 processors bring extensive DSP performance at ultra-low power levels. Other processors such as OMAP-L1x, OMAP35x and TMS320C6000™ target applications that require much higher performance than 100 MHz. They are also the industry's lowest power 16-bit DSPs.

So, C5000 DSPs and the new products we're announcing today sit nicely between MSP430 and OMAP™/C6000 embedded processors from TI.

What is the market opportunity for TI in this space?

The TMS320C5505 and TMS320C5504 DSPs bring ultra-low power DSP functionality of up to 100 MHz at very low cost for a wide variety of portable applications. The market for smart portable devices is growing significantly across medical, consumer and industrial applications. The TMS320C5000™ DSP platform complements MSP430 and other low-power processors from TI to enable smart analysis and diagnostics in portable devices. With excellent standby and dynamic power, C5000™ DSPs cater to a range of markets across “mostly-off” to “mostly-on” end equipments.

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