TMS320C674x Floating-Point DSPs

Low power and high precision with TMS320C674x floating-point DSPs

Designers now have the ability to bring portability to audio, medical, industrial and other applications requiring the precision, wide dynamic range and time-to-market benefits of floating-point DSPs. Using three times less power than existing floating-point DSPs in today's market, the C674x devices support 32-bit single-precision and 64-bit double-precision floating-point arithmetic and are the industry's lowest-power floating-point DSPs. Slated for sampling in Q4 2008, the power consumption ranges from 6 mW* in deep-sleep mode to 420 mW‡ total power in active mode.

The wide dynamic range and 32-/64-bit accuracy of the C674x devices enable true floating-point precision with the added features of being able to add portability or increase the battery life of applications. Through pin-for-pin compatibility with select OMAP-L1x applications processors, designers can easily add feature-rich GUIs, touch-screen capability, additional networking capabilities or more features to products without having to reconfigure the hardware layout. The high-performance 32-/64-bit C674x+ processor core, flexible cache architecture, enhanced DMA subsystem, and dynamic power management (DPM) functionality provide a flexible, scalable platform to bring portability to a variety of applications needing high precision, dynamic range and the ease of development of a floating-point processor. C674x processors give designers the power to add features to existing battery-operated products, portability to traditionally wired applications, lower heat dissipation, lower energy costs on wired applications, increase energy saver capability or meet any other application requirements for a high-precision, low-power, low-cost processor.

Increased battery life through TI advanced process technology

Combining industry-leading, cutting-edge 65-nm process technology with low-leakage transistor technology, the C674x generation of DSPs offers wide dynamic range and 32-/64-bit floating-point accuracy with power consumption as low as 6 mW* in deep-sleep mode, 11 mW† in standby mode and 420 mW‡ total power in active mode. The combination of high-performance, low-power architecture and power management software technology provides not only frequency and voltage granularity to meet design needs, but also the ability to manipulate individual peripherals to further optimize power consumption. Designers can save significant system power through peripheral integration such as USB 1.1 Host and USB 2.0 Host/Device/OTG, MMC/SD controllers, EMAC 10/100, universal parallel port (uPP) for interfacing with FPGAs, data

Key Features:

- Industry's lowest-power floating-point DSPs
- High precision and wide dynamic range enabled through the 24-/32-bit accuracy of the floating-point DSP core
- Portability for traditionally wired applications through low power and rich connectivity peripherals
- Reduces system cost through high feature integration and low pricing starting at less than USD $11 @ 100u quantities
- Up to 20× lower standby power and 1/3 the power consumption of existing floating-point devices

* Power-use scenario – deep sleep: 0.95-V core, DSP clock OFF, all peripherals clock OFF, RTC ON, PLL disabled, 25°C

† Power-use scenario – standby: 0.95-V core, DSP clock OFF, all peripherals clock OFF, RTC ON, PLL enabled, 25°C

‡ Power-use scenario – active: 70% max load of CPU running at 300 MHz at 1.2V, mDDR 133 MHz/16 bit accessed 50% of the time, McBSP, SPI and GPIOs peripherals are active, 25°C

Technical details

Architectural features

- Up to 1800 MFLOPs performance with power consumption from as low as 6 mW
- Audio tuned peripherals including SATA, USB 2.0 OTG, McASPs and PWMs
- High-performance 32-/64-bit C674x processor core with up to 300 MHz (2400 MFLOPs) performance

System integration

- Up to 448 KB of internal memory through a combination of L1/L2 cache and internal RAM memory
- Universal parallel port provides a direct interface to FPGAs, high-speed A/Ds, data converters and inter-processor communication
- Up to 64-channel DMA supporting 1D, 2D and 3D data transfers
- NAND flash controller with 8-/16-bit interface for commands, addresses and data
- Connectivity: host DMA port, UARTs, McASP/McBSPs, SPI, I²C, MMC/SD controllers, USB 1.1/2.0 interfaces, SATA, eCAP, eQEP
- Memory controller options providing a glueless connection to multiple banks of external mDDR, DDR2, SDRAM, SRAM and Flash
- Package options: QFP, BGA, nFBGA in various sizes and ball pitches (commercial temperature and industrial range 0°C to 70°C or –40°C to 85°C)

Applications

- Music effects
- Industrial
- Conference phones
- Portable medical

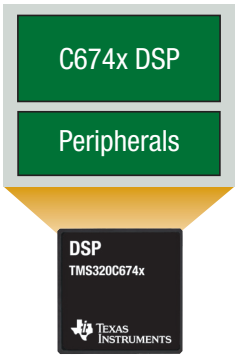
converters and other inter-processor communication, uHPI, multi-channel serial ports and an LCD controller negating the need for external processors and logic. On-chip memory scalability options of up to 448 KB reduce the need for external memory in some applications saving both power and cost.

C674x DSPs are available in a wide variety of packages to cater to applications with size constraints.

Get started quickly

To get started quickly, designers can purchase C674x development kits with built-in emulation for less than USD $400 and limited-use development kits for less than USD $100. All kits include full board support packages and the associated debugging environment. C674x DSPs are supported by Code Composer Studio™ (CCStudio) integrated development environment.

For more information on TMS320C674x floating-point DSPs, visit **www.ti.com/c674x**.



6 mW*–420 mW‡

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SPRT466B

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