Product Bulletin

TMS320C67x™ Floating-Point DSP Generation

Key Benefits

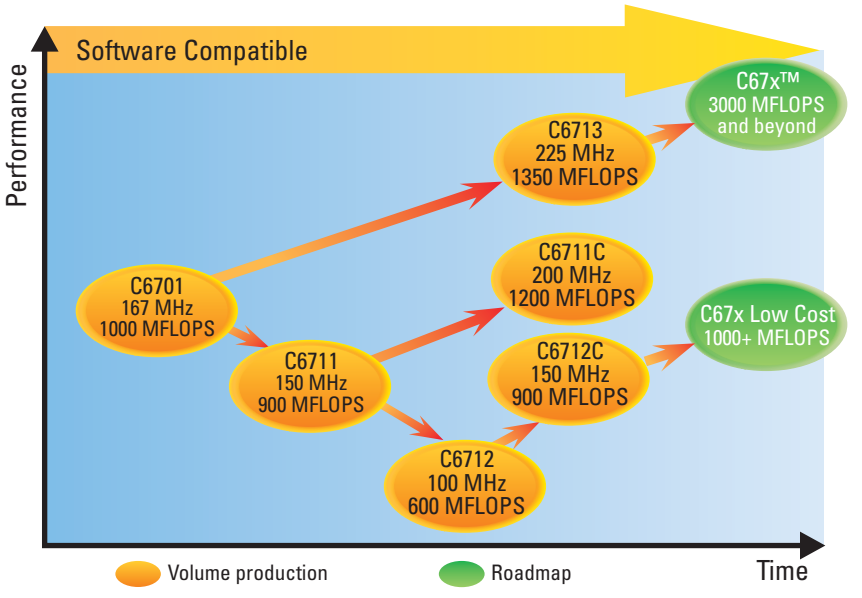
- **Excellent price/performance value** – C67x™ DSPs offer a broad range of performance options at attractive price points
- **Fast time-to-market** – New C67x DSP Library helps speed development cycles
- **Code compatibility** – C67x DSPs provide scalability and protect customer's code investment

TI floating-point DSPs raise the bar in performance, set new levels in cost efficiency and offer low power dissipation—energizing existing products and supporting the development of next-generation applications. Several features of TI's floating-point DSPs make them attractive for applications that require a larger dynamic range and a higher level of precision than offered by typical 16-bit fixed-point devices. For example, a 32-bit word-width enables high fidelity audio systems to produce more life-like sound. Graphics and imaging systems need the full 32 bits to achieve greater resolution and more realistic visuals. In addition, the DSPs' substantial processing power provides higher frame rates and additional polygon manipulations that further enhance image sharpness and quality. Motion control, automotive, robotics, instrumentation, military and voice/speech applications similarly benefit from the extra precision and high performance of TI floating-point DSPs.

Applications

- Professional audio
- Instrumentation
- Test/Measurement
- Medical
- Communications
- Industrial automation

C67x DSP Roadmap

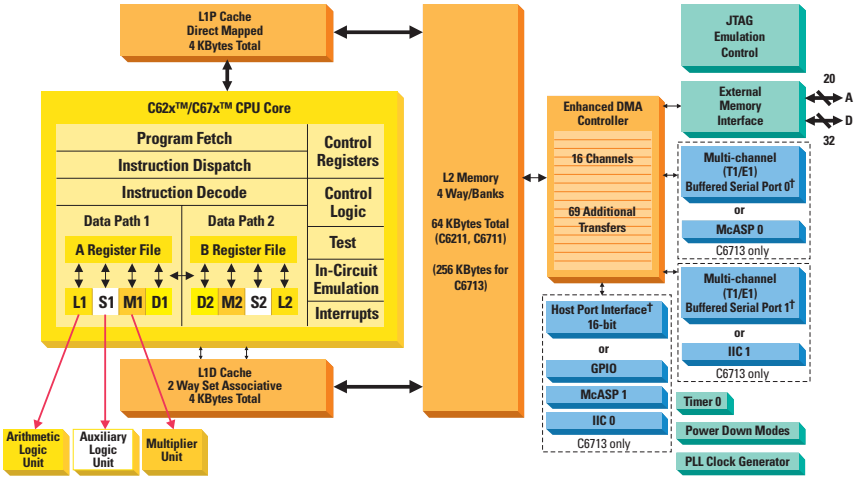


The TMS320C6713 DSP is the newest member of the C67x DSP generation. It features a performance of 1350 MFLOPS, 2 Mbits of on-chip SRAM and the new Multi-channel Audio Serial Port (McASP).

Unparalleled Performance with VelociTI™ Architecture

All TMS320C6000™ DSPs are based on the same CPU core, featuring VelociTI, an advanced very long instruction word (VLIW) architecture designed to achieve high performance through increased instruction-level parallelism. TI achieves breakthrough performance by adding floating-point instructions to six of the C6000™ DSP architecture's eight

TMS320C6711/C6712/C6713 DSP Block Diagram



The C6713 DSP offers the audio customer base unparalleled levels of flexibility and performance. This superset of the C6711 and C6712 DSPs includes I²S, I²C and S/PDIF transmit support as well as enhanced memory space. Non-audio customers can also use this DSP as an upward migration path from the C6711 DSP.

functional units. The eight functional units, including two multipliers and six arithmetic units, are highly orthogonal, providing the compiler and Assembly Optimizer with many execution resources. Eight 32-bit RISC-like instructions are fetched by the CPU each cycle. The VelociTI™ instruction packing features allow these eight instructions to be executed in parallel, in serial, or in parallel/ serial combinations. This optimized scheme enables significant reductions in code size, program fetches and power consumption.

Unified Architecture Provides Code Compatibility

With the same VelociTI core, the TMS320C67x™ DSPs are code and pin-for-pin compatible with TMS320C62x™ fixed-point DSPs. The C67x™ DSP instruction set is a superset of that for the C62x™ DSP devices. This allows developers to take advantage of the ease-of-use of floating-point by prototyping on the C6711 DSP, and then porting their code to the fixed-point C6211 DSP for reduced production costs. Together with the ease of a single development platform, this code-transfer capability between fixed- and floating-point DSPs results in significant savings in development, resource and manufacturing costs.

Features

- 100% code-compatible DSPs: Fixed-point C62x DSP—16-bit multiply, 32-bit instructions and Floating-point C67x DSP—32-bit instructions, single and double precision
- Four data memory access (DMA) channels with bootloading capability (enhanced DMA with 16 channels for C6711, C6712 and C6713 DSPs)
- Up to 2 Mbit on-chip memory
- Two multi-channel buffered serial ports (McBSPs)
- 16-bit host-port interface (HPI)
- Two 32-bit timers

TMS320C6713 DSP Starter Kit (DSK)

The C6713 DSK is based on the high-precision C6713 DSP. Its parallel-port-interfaced platform enables customers and third parties to efficiently develop and test applications for the C62x and C67x DSPs. And since the C6713 DSP is code and pin compatible with the C6711 DSP, developers can start now on next-generation designs.

Key Features

- The C6713 DSP offers performance levels up to 1800 MIPS and 1350 MFLOPS, two-level cache and VLIW architecture
- The C6713 DSK includes 8 MB of on-board SDRAM and an emulation header with McASP, HPI and I²C interfaces
- Embedded JTAG emulation via the parallel port. Support for

C67x DSP Product Spectrum

	Software Compatible →					
	C6701	C6711	C6711C	C6712	C6712C	C6713
Performance	1000 MFLOPS	900 MFLOPS	1200 MFLOPS	600 MFLOPS	900 MFLOPS	1350 MFLOPS
Memory (Bytes)	128K	72K L1/L2	72K L1/L2	72K L1/L2	72K L1/L2	256K L1/L2
Key Feature	Flat Memory	HPI	Perf. Upgrade	Low Cost	Perf. Upgrade	Flt.-Pt. Perf./McASP
BGA Package	35 mm/352	27 mm/256	27 mm/272	27 mm/256	27 mm/272	27 mm/272
Internal Power (Typ)	1.4 W @ 167 MHz	1.1 W @ 150 MHz	0.8 W @ 200 MHz	0.7 W @ 100 MHz	0.5 W @ 150 MHz	1.2 W @ 225 MHz
10 KU Price (Estimated)	$104.80	$28.50	$18.65	$16.73	$13.50	$26.85
Production	Now	Now	Now	Now	Now	Now

The C67x DSP generation offers engineers the flexibility to configure peripherals to fit the needs of their applications at an affordable cost.

external XDS510™ or XDS560™ emulators
- Expansion memory and peripheral connectors for daughterboard support
- Ships with Code Composer Studio™ DSK tools
- Available now (TI part # TMDSDSK6713)

TMS320C67x™ DSP Evaluation Module

The C67x™ DSP evaluation module (EVM) from TI provides a comprehensive platform that allows developers to benchmark their systems by running application software on target C6701 DSP hardware. The EVM saves designers the time and expense of building their own application development boards—simplifying the rapid development of powerful next-generation DSP products.

Get To Market Faster with TI's Development Environment

eXpressDSP™ Software and Development Tools

For rapid product development, TI's floating-point DSPs are supported by eXpressDSP Software and Development Tools that slashes development time by over 50 percent while improving product robustness.

Made up of four key components, eXpressDSP Software Technology enables developers to tap into the full power of TI DSPs:
- Code Composer Studio Development Tools
- DSP/BIOS™ Kernel
- TMS320™ DSP Algorithm Standard
- TI DSP Third-Party Network

C67x DSP Generation Hardware Development Tools

Description	Part #	$U.S.+
TMS320C6713 DSP Starter Kit (DSK)	TMDSDSK6713	395
TMS320C67x DSK Stereo Audio Card†	TMDX326040A (U.S. part number)	50
Audio Developer's Kit°	TMDSADK6713	495
EVALUATION MODULES (EVMs)		
TMS320C67x™ EVM Bundle*	TMDS3260D6701	3,495
TMS320C67x EVM board only (Code Composer Studio™ Dev Tools sold separately)	TMDS3260C6701	1,995

+ Prices are quoted in U.S. dollars and represent year 2003 suggested resale pricing. Red indicates new tool.
* Includes Code Composer Studio Development Tools, DSP/BIOS™ kernel, code generation tools (C/C++ compiler/assembler/linker), RTDX™, target hardware board and device drivers.
† Includes Code Composer Studio Development Tools, DSP/BIOS kernel, code generation tools (C/C++ compiler/assembler/linker) with 256K limited application size, RTDX, EVM board with device drivers and profile-based compiler.
° Available 3Q03.

C67x DSP Design Documentation

TMS320C6711 DSP Collateral	Literature #
TMS320C6711B, TMS320C6711C DSPs Data Sheet	SPRS088
Migrating from TMS320C6211/C6711 to TMS320C6711C DSP	SPRA837

TMS320C6712 DSP Collateral	Literature #
TMS320C6712, TMS320C6712C DSPs Data Sheet	SPRS148
Migrating from TMS320C6712 to TMS320C6712C DSP	SPRA852

TMS320C6713 DSP Collateral	Literature #
TMS320C6713 DSP Data Sheet	SPRS186
How to Begin Development Today with the TMS320C6713 DSP	SPRA809
TMS320C6000™ DSP Inter-Integrated Circuit (I^2C) Module Reference Guide	SPRU175
TMS320C6000 DSP Phase-Locked Loop (PLL) Controller Peripheral Reference Guide	SPRU233
Multi-channel Audio Serial Port (McASP) User's Guide	SPRU041
Migrating from TMS320C6211/C6711 to TMS320C6713 DSP	SPRA851

TMS320C6000™ DSP Platform Software Development Tools§

Description	Part #	$U.S.+
Essential Guide to Getting Started with DSP CD-ROM Includes Code Composer Studio 90-Day Free Evaluation Tools‡	SPRC067 **(www.dspvillage.ti.com/freetools)**	Free
C6000™ Code Composer Studio Development Tools†	TMDS324685C-07	2,995
C6000 Code Composer Studio Development Tools Annual Software Subscription	TMDS322685C-03	600
TMS320C67x DSP Library	SPRC121 **(www.ti.com/c67xdsplib)**	Free
C67x DSP Fast Run-Time Support (FastRTS) Library	SPRC060 **(www.ti.com/sc/c67xfrtslib)**	Free

§ All C6000 DSP tools support C62x™, C67x and C64x DSP products. Red indicates new tool.
+ Prices are quoted in U.S. dollars and represent year 2003 suggested resale pricing.
† Includes Code Composer Studio Development Tools, DSP/BIOS kernel, code generation tools (C/C++ compiler/assembler/linker), XDS510™ and XDS560™ device drivers (emulation software), RTDX, simulator, and profile-based compiler.
‡ Includes full-featured Code Composer Studio Development Tools, code generation tools (C/C++ compiler/assembler/linker) and simulator all limited to 90 days.

Get Started Today

The low-cost, full featured TMS320C6713 DSP Starter Kit provides system design engineers with an easy-to-use, cost-effective way to develop high-performance C6000™ DSP designs. This is available today through the TI estore for US $395 or through your local TI representative.

One-day workshops are also available in North America and Europe. Visit our website at **www.ti.com/floatingpointworkshops** for more information.

Many C67x™ DSPs are in production today with select devices available offering free samples. For information, contact your local TI representative or visit our website at **www.ti.com/floatingpointdsps**.

Key Features of Code Composer Studio™ Development Tools

Features	Description	Benefit
Open Plug-In Architecture	For the first time, developers can mix-and-match tools from the largest DSP third-party network and seamlessly plug them into the Code Composer Studio IDE.	Users can spend less time developing their own utilities and focus their energies on product innovation and differentiation.
Integrated Host and DSP Target Communication	Another first, the combination of DSP/BIOS™ and RTDX™ technologies enables the host development environment to be fully aware of and integrated with the DSP target and its resources.	This underlying foundation allows for advanced real-time functionality and facilitates all phases of the DSP code development cycle.
Real-Time Analysis	Real-time analysis is accomplished by a tight set of DSP/BIOS and RTDX functions that allow system developers to make function calls during code development and to collect information during application execution.	These functions enable developers to see the time-related interactions between code sections, taking debugging functionality to a new level.
Advanced Data Visualization	Using Probe Points™ and file I/O, a developer can view data and signals at any point in the algorithm in native format or in processed form.	This oscilloscope-like functionality provides a window into the algorithm, enabling faster analysis, easier data interpretation and increased productivity.

The Code Composer Studio Development Tools is an advanced, open DSP development environment for the C6000™ DSP Platform.

TI Worldwide Technical Support

Internet

TI Semiconductor Product Information Center Home Page
support.ti.com

TI Semiconductor KnowledgeBase Home Page
support.ti.com/sc/knowledgebase

Product Information Centers

Americas

Phone	+1(972) 644-5580
Fax	+1(972) 927-6377
Internet/Email	support.ti.com/sc/pic/americas.htm

Europe, Middle East, and Africa

Phone	
Belgium (English)	+32 (0) 27 45 55 32
Finland (English)	+358 (0) 9 25173948
France	+33 (0) 1 30 70 11 64
Germany	+49 (0) 8161 80 33 11
Israel (English)	1800 949 0107
Italy	800 79 11 37
Netherlands (English)	+31 (0) 546 87 95 45
Spain	+34 902 35 40 28
Sweden (English)	+46 (0) 8587 555 22
United Kingdom	+44 (0) 1604 66 33 99
Fax	+(49) (0) 8161 80 2045
Email	epic@ti.com
Internet	support.ti.com/sc/pic/euro.htm

Japan

Fax	International	+81-3-3344-5317
	Domestic	0120-81-0036
Internet/Email	International	support.ti.com/sc/pic/japan.htm
	Domestic	www.tij.co.jp/pic

Asia

Phone	
International	+886-2-23786800
Domestic	Toll-Free Number
Australia	1-800-999-084
China	108-00-886-0015
Hong Kong	800-96-5941
Indonesia	001-803-8861-1006
Korea	080-551-2804
Malaysia	1-800-80-3973
New Zealand	0800-446-934
Philippines	1-800-765-7404
Singapore	800-886-1028
Taiwan	0800-006800
Thailand	001-800-886-0010
Fax	886-2-2378-6808
Email	tiasia@ti.com
Internet	support.ti.com/sc/pic/asia.htm

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