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TMS320C6713B Status: ACTIVE
Floating-Point Digital Signal Processors

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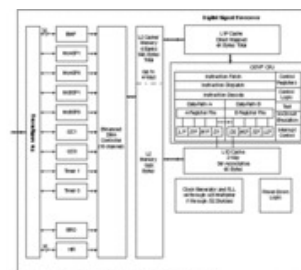for TMS320C6713I

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Datasheet

📄 **TMS320C6713B Floating-Point Digital Signal Processor (Rev. B)** (PDF 2227 KB)
30 Jun 2006

TMS320C6713, TMS320C6713B DSPs Silicon Errata (Silicon Revisions 2.0, 1.1) (Rev. J) (PDF 319 KB) 6917 views
12 Aug 2005

Functional Block Diagram

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News Release - 17 Sep 20
Hybrid DVR from Siemens
based on TI DM648
provides...

	TMS320C6713B-167	TMS320C6713B-200	TMS320C6713B-225	TMS320C6713B-300
CPU	1 C67x	1 C67x	1 C67x	1 C67x
Peak MMACS	334	400	450	600
Frequency(MHz)	167	200	225	300
On-Chip L1/SRAM	8 KB	8 KB	8 KB	8 KB
On-Chip L2/SRAM	64 KB Cache/192 KB SRAM	64 KB Cache/192 KB SRAM	64 KB Cache/192 KB SRAM	64 KB Cache/192 KB SRAM
EMIF	1 32-Bit	1 32-Bit	1 32-Bit	1 32-Bit
External Memory Type Supported	Async SRAM,SBSRAM,SDRAM	Async SRAM,SBSRAM,SDRAM	Async SRAM,SBSRAM,SDRAM	Async SRAM,SBSRAM,SDRAM
DMA	16 (EDMA)	16 (EDMA)	16 (EDMA)	16-Ch EDMA
HPI	1 16-Bit	1 16-Bit	1 16-Bit	1 16-Bit
McBSP	2	2	2	2
McASP	2	2	2	2
I2C	2	2	2	2
Timers	(2) 32-bit	(2) 32-bit	(2) 32-bit	2 32-Bit GP
Core Supply (Volts)	1.2	1.2/1.26	1.26	1.4 V
IO Supply (Volts)	3.3 V	3.3 V	3.3 V	3.3 V

Operating Temperature Range (°C)	-40 to 105	0 to 90,-40 to 105	0 to 90	0 to 90
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TMS320C6727B: Floating-Point Digital Signal Processor
TMS320DM642: Video/Imaging Fixed-Point Digital Signal Processor
TMS320VC5509A: Fixed-Point Digital Signal Processor
TMS320C6747: Floating-Point Digital Signal Processor
OMAP-L137: Low-Power Applications Processor
TMS320F28335: Delfino Microcontroller

More Related Products

Product Information

Features

Highest-Performance Floating-Point Digital Signal Processor (DSP): TMS320C6713B
  Eight 32-Bit Instructions/Cycle
  32/64-Bit Data Word
  300-, 225-, 200-MHz (GDP and ZDP), and 225-, 200-, 167-MHz (PYP) Clock Rates
  3.3-, 4.4-, 5-, 6-Instruction Cycle Times
  2400/1800, 1800/1350, 1600/1200, and 1336/1000 MIPS/MFLOPS
  Rich Peripheral Set, Optimized for Audio
  Highly Optimized C/C++ Compiler
  Extended Temperature Devices Available
Advanced Very Long Instruction Word (VLIW) TMS320C67x™ DSP Core
  Eight Independent Functional Units:
      2 ALUs (Fixed-Point)
      4 ALUs (Floating-/Fixed-Point)
      2 Multipliers (Floating-/Fixed-Point)
  Load-Store Architecture With 32 32-Bit General-Purpose Registers
  Instruction Packing Reduces Code Size
  All Instructions Conditional
Instruction Set Features
  Native Instructions for IEEE 754
      Single- and Double-Precision
  Byte-Addressable (8-, 16-, 32-Bit Data)
  8-Bit Overflow Protection
  Saturation; Bit-Field Extract, Set, Clear; Bit-Counting; Normalization
L1/L2 Memory Architecture
  4K-Byte L1P Program Cache (Direct-Mapped)
  4K-Byte L1D Data Cache (2-Way)
  256K-Byte L2 Memory Total: 64K-Byte L2 Unified Cache/Mapped RAM, and 192K-Byte
  Additional L2 Mapped RAM
Device Configuration
  Boot Mode: HPI, 8-, 16-, 32-Bit ROM Boot
  Endianness: Little Endian, Big Endian
32-Bit External Memory Interface (EMIF)
  Glueless Interface to SRAM, EPROM, Flash, SBSRAM, and SDRAM
  512M-Byte Total Addressable External Memory Space
Enhanced Direct-Memory-Access (EDMA) Controller (16 Independent Channels)
16-Bit Host-Port Interface (HPI)
Two McASPs
  Two Independent Clock Zones Each (1 TX and 1 RX)
  Eight Serial Data Pins Per Port: Individually Assignable to any of the Clock Zones
  Each Clock Zone Includes:
      Programmable Clock Generator
      Programmable Frame Sync Generator
      TDM Streams From 2-32 Time Slots
      Support for Slot Size:

        8, 12, 16, 20, 24, 28, 32 Bits
       Data Formatter for Bit Manipulation
     Wide Variety of I2S and Similar Bit Stream Formats
     Integrated Digital Audio Interface Transmitter (DIT) Supports:
        S/PDIF, IEC60958-1, AES-3, CP-430 Formats
        Up to 16 transmit pins
        Enhanced Channel Status/User Data
     Extensive Error Checking and Recovery
   Two Inter-Integrated Circuit Bus (I^{2}C Bus™) Multi-Master and Slave Interfaces
   Two Multichannel Buffered Serial Ports:
     Serial-Peripheral-Interface (SPI)
     High-Speed TDM Interface
     AC97 Interface
   Two 32-Bit General-Purpose Timers
   Dedicated GPIO Module With 16 pins (External Interrupt Capable)
   Flexible Phase-Locked-Loop (PLL) Based Clock Generator Module

   IEEE-1149.1 (JTAG [†]) Boundary-Scan-Compatible
   208-Pin PowerPAD™ PQFP (PYP)
   272-BGA Packages (GDP and ZDP)
   0.13-µm/6-Level Copper Metal Process
     CMOS Technology

   3.3-V I/Os, 1.2 [‡] -V Internal (GDP/ZDP/ PYP)
   3.3-V I/Os, 1.4-V Internal (GDP/ZDP) [300 MHz]

TMS320C67x and PowerPAD are trademarks of Texas Instruments.

I^{2}C Bus is a trademark of Philips Electronics N.V. Corporation

All trademarks are the property of their respective owners.

[†] IEEE Standard 1149.1-1990 Standard-Test-Access Port and Boundary Scan Architecture.

[‡] These values are compatible with existing 1.26-V designs.

TMS320C6000, eXpressDSP, Code Composer Studio, and DSP/BIOS are trademarks of Texas Instruments.

[†] Throughout the remainder of this document, TMS320C6713B shall be referred to as C6713B or 13B.

Description

The TMS320C67x™ DSPs (including the TMS320C6713B device [†]) compose the floating-point DSP generation in the TMS320C6000™ DSP platform. The C6713B device is based on the high-performance, advanced very-long-instruction-word (VLIW) architecture developed by Texas Instruments (TI), making this DSP an excellent choice for multichannel and multifunction applications.

Operating at 225 MHz, the C6713B delivers up to 1350 million floating-point operations per second (MFLOPS), 1800 million instructions per second (MIPS), and with dual fixed-/floating-point multipliers up to 450 million multiply-accumulate operations per second (MMACS).

Operating at 300 MHz, the C6713B delivers up to 1800 million floating-point operations per second (MFLOPS), 2400 million instructions per second (MIPS), and with dual fixed-/floating-point multipliers up to 600 million multiply-accumulate operations per second (MMACS).

The C6713B uses a two-level cache-based architecture and has a powerful and diverse set of peripherals. The Level 1 program cache (L1P) is a 4K-byte direct-mapped cache and the Level 1 data cache (L1D) is a 4K-byte 2-way set-associative cache. The Level 2 memory/cache (L2) consists of a 256K-byte memory space that is shared between program and data space. 64K bytes of the 256K bytes in L2 memory can be configured as mapped memory, cache, or combinations of the two. The remaining 192K bytes in L2 serves as mapped SRAM.

The C6713B has a rich peripheral set that includes two Multichannel Audio Serial Ports (McASPs), two Multichannel Buffered Serial Ports (McBSPs), two Inter-Integrated Circuit (I2C) buses, one dedicated General-Purpose Input/Output (GPIO) module, two general-purpose timers, a host-port interface (HPI), and a glueless external memory interface (EMIF) capable of interfacing to SDRAM, SBSRAM, and asynchronous peripherals.

The two McASP interface modules each support one transmit and one receive clock zone. Each of the McASP has eight serial data pins which can be individually allocated to any of the two zones. The serial port supports time-division multiplexing on each pin from 2 to 32 time slots. The C6713B has sufficient bandwidth to support all 16 serial data pins transmitting a 192 kHz stereo signal. Serial data in each zone may be transmitted and received on multiple serial data pins simultaneously and formatted in a multitude of variations on the Philips Inter-IC Sound (I2S) format.

In addition, the McASP transmitter may be programmed to output multiple S/PDIF, IEC60958, AES-3, CP-430 encoded data channels simultaneously, with a single RAM containing the full

implementation of user data and channel status fields.

The McASP also provides extensive error-checking and recovery features, such as the bad clock detection circuit for each high-frequency master clock which verifies that the master clock is within a programmed frequency range.

The two I2C ports on the TMS320C6713B allow the DSP to easily control peripheral devices and communicate with a host processor. In addition, the standard multichannel buffered serial port (McBSP) may be used to communicate with serial peripheral interface (SPI) mode peripheral devices.

The TMS320C6713B device has two bootmodes: from the HPI or from external asynchronous ROM. For more detailed information, see the *bootmode* section of this data sheet.

The TMS320C67x DSP generation is supported by the TI eXpressDSP™ set of industry benchmark development tools, including a highly optimizing C/C++ Compiler, the Code Composer Studio™ Integrated Development Environment (IDE), JTAG-based emulation and real-time debugging, and the DSP/BIOS™ kernel.

Pricing / Packaging / CAD Design Tools / Samples

		Price	Packaging		CAD Design Tools		Samples
Device	Status	Price | Quantity	Package | Pins	Package QTY | Package Carrier	Symbols	Footprints	Samples
TMS320C6713BGDP225	ACTIVE	25.45 | 100u	BGA (GDP) | 272	40	View	View	Purchase Samples
TMS320C6713BGDP300	ACTIVE	33.75 | 100u	BGA (GDP) | 272	40	View	View	Purchase Samples
TMS320C6713BPYP200	ACTIVE	19.45 | 100u	HLQFP (PYP) | 208	36	View		Purchase Samples
TMS320C6713BZDP225	ACTIVE	25.45 | 100u	BGA (ZDP) | 272	40	View	View	Purchase Samples
TMS320C6713BZDP300	ACTIVE	33.75 | 100u	BGA (ZDP) | 272	40	View	View	Purchase Samples
TMS32C6713BGDPA200	ACTIVE	25.90 | 100u	BGA (GDP) | 272	40	View	View	Purchase Samples
TMS32C6713BPYPA167	ACTIVE	19.45 | 100u	HLQFP (PYP) | 208	36	View		Purchase Samples
TMS32C6713BPYPA200	ACTIVE	23.25 | 100u	HLQFP (PYP) | 208	36	View		Purchase Samples
TMS32C6713BZDPA200	ACTIVE	25.90 | 100u	BGA (ZDP) | 272	40	View	View	Purchase Samples
TMX320C6713BGDP	OBSOLETE		BGA (GDP) | 272				Not Available

* Suggested Resale Price per unit (USD) for BUDGETARY USE ONLY. For higher volume price quotes,prices in local currency or delivery quotes, please contact your local Texas Instruments Sales Office or Authorized Distributor.

Inventory

Reported Distributor Inventory as of 9:05 AM GMT, 30 Oct 2009			
Region	Company	In Stock	Purchase
TMS320C6713BGDP225		TI Lead Time*: 20 Weeks	
Americas	Rochester Electronics	>1k	Add to Cart
TMS320C6713BGDP300		TI Lead Time*: 20 Weeks	
Europe	Compel	2	Add to Cart
TMS320C6713BPYP200		TI Lead Time*: 20 Weeks	
Americas	Arrow	50	Add to Cart

Europe	Avnet-SILICA	>1k	Add to Cart

TMS320C6713BZDP225　　TI Lead Time*: 20 Weeks

Americas	Arrow	117	Add to Cart
Europe	Avnet-SILICA	216	Add to Cart

TMS320C6713BZDP300　　TI Lead Time*: 20 Weeks

Americas	Arrow	114	Add to Cart
Asia	WPI	49	Add to Cart
Europe	Avnet-SILICA	69	Add to Cart

TMS32C6713BGDPA200　　TI Lead Time*: 20 Weeks

Americas	Arrow	239	Add to Cart
	Avnet	50	Add to Cart
Worldwide	Mouser Electronics	53	Add to Cart

TMS32C6713BPYPA167　　TI Lead Time*: 6 Weeks

Americas	Arrow	734	Add to Cart
	Avnet	16	Add to Cart
	Rochester Electronics	78	Add to Cart

TMS32C6713BPYPA200　　TI Lead Time*: 23 Weeks

Americas	Rochester Electronics	103	Add to Cart
Worldwide	Mouser Electronics	7	Add to Cart

TMS32C6713BZDPA200　　TI Lead Time*: 20 Weeks

Americas	Arrow	80	Add to Cart
Europe	Avnet-SILICA	217	Add to Cart

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** Lead time information is not available at this time. However, our information is updated daily so please check back with us soon. Please contact your preferred TI Authorized Distributor for additional information.

Quality & Lead (Pb)-Free Data

Device	Product Content				DPPM / MTBF / FIT Rate
	Eco Plan*	Lead / Ball Finish	MSL Rating / Peak Reflow	Details	Details
TMS320C6713BGDP225	TBD	SNPB	Level-3-220C-168 HR	View	View
TMS320C6713BGDP300	TBD	SNPB	Level-3-220C-168 HR	View	View
TMS320C6713BPYP200 🌐	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-4-260C-72 HR	View	View
TMS320C6713BZDP225 🌐	Pb-Free (RoHS)	SNAGCU	Level-3-260C-168 HR	View	View
TMS320C6713BZDP300 🌐	Pb-Free (RoHS)	SNAGCU	Level-3-260C-168 HR	View	View
TMS32C6713BGDPA200	TBD	SNPB	Level-3-220C-168 HR	View	View
TMS32C6713BPYPA167 🌐	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-4-260C-72 HR	View	View

TMS32C6713BPYPA200 🌐	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-4-260C-72 HR	View	View
TMS32C6713BZDPA200 🌐	Pb-Free (RoHS)	SNAGCU	Level-3-260C-168 HR	View	View

* The planned eco-friendly classification: Pb-Free (RoHS) or Pb-Free (RoHS Exempt) or Green (RoHS & no Sb/Br) - please click on the Product Content Details "View" link in the table above for the latest availability information and additional product content details.

If the information you are requesting is not available online at thi contact one of our Product Information Centers regarding the ava this information.

Tools & Software

Name	Part #	Company	Tool / Software Type
Code Composer Studio IDE Subscription Service for v3.3	CCSTUDIOSUBSCRIPTIONS	Texas Instruments	Code Composer Studio(TM) IDE
Code Composer Studio Integrated Development Environment (IDE) - v4.x	CCSTUDIO	Texas Instruments	Code Composer Studio(TM) IDE
C6701 EVM bundled with Code Composer Studio	TMDSEVM6701-4	Texas Instruments	Development Boards/EVMs
C6701 Evaluation Module (EVM) Bundle	TMDS32600C6701	Texas Instruments	Development Boards/EVMs
SMT374-300 DSP Module		Sundance Multiprocessor Technology LTD	Development Boards/EVMs
ORS-112		Traquair Data Systems, Inc.	Development Boards/EVMs
ORS-114		Traquair Data Systems, Inc.	Development Boards/EVMs
ORS-116		Traquair Data Systems, Inc.	Development Boards/EVMs
Multichannel Vocoder Demonstration Software for C6211 or C6711 DSK	MCVTDK6211	Texas Instruments	Development Platforms
XDS510 Class Emulators	XDS510	Texas Instruments	Emulators/Analyzers
Blackhawk™ LAN560 JTAG Emulator		Blackhawk	Emulators/Analyzers
Blackhawk™ PCI560 JTAG Emulator for TI DSPs		Blackhawk	Emulators/Analyzers
Blackhawk™ USB560 JTAG Emulator		Blackhawk	Emulators/Analyzers
Blackhawk™ USB560BP JTAG Emulator		Blackhawk	Emulators/Analyzers
JTAGjet USB 2.0 Emulator for TMS320		Signum Systems	Emulators/Analyzers
XDS510PP PLUS JTAG Emulator		Spectrum Digital, Inc.	Emulators/Analyzers
XDS510USB JTAG Emulator		Spectrum Digital, Inc.	Emulators/Analyzers
XDS510USB PLUS JTAG Emulator		Spectrum Digital, Inc.	Emulators/Analyzers
C6711 DSP Starter Kit (DSK)	TMDS320006711	Texas Instruments	Starter Kits
TMS320C6713 DSP Starter Kit (DSK)	TMDSDSK6713	Texas Instruments	Starter Kits
TMS320C6000 Chip Support Library	SPRC090	Texas Instruments	Application Software
Driver Developer's Kit (DDK)	SPRC118	Texas Instruments	Application Software
TMS320C67x DSP Library	SPRC121	Texas Instruments	Signal Processing Libraries
C67x Fast Run-Time Support (RTS) Library	SPRC060	Texas Instruments	Signal Processing Libraries

Related Products

Part #	Name	Product Family	Comments
TMS320C6727B	Floating-Point Digital Signal Processor	C6000 FLOATING/FIXED-POINT DSPS - TMS320C672X DSPS	The device has SIMILAR FUNCTIONALITY but is not functionally equivalent to the compared device.

PCM4204	118dB SNR 4-Channel Audio ADC	AUDIO CONVERTERS AND CODECS - AUDIO A TO D CONVERTERS	4ch 118dB ADC
PCM4202	118dB SNR Stereo Audio ADC	AUDIO CONVERTERS AND CODECS - AUDIO A TO D CONVERTERS	4ch 118dB DAC
PCM4104	118dB SNR 4-Channel Audio DAC	AUDIO CONVERTERS AND CODECS - AUDIO D TO A CONVERTERS	PWM POWER SUPPLY CONTROLLERS
SRC4392	High-end Combo Sample Rate Converter	DIGITAL AUDIO INTERFACE - SAMPLE RATE CONVERTERS	144dB Combo SRC & S/PDIF Transciever
SRC4382	Combo Sample Rate Converter	DIGITAL AUDIO INTERFACE - SAMPLE RATE CONVERTERS	128dB Combo SRC & S/PDIF Transciever
TPS2110A	Autoswitching Power Mux	POWER MUXES AND CURRENT LIMITED SWITCHES - POWER MUXES	POWER MUXES
TPS3808G33	Low Quiescent Current, Programmable-Delay Supervisory Circuit	POWER MANAGEMENT - SUPERVISORY CIRCUITS(VOLTAGE SUPERVISORS)	SUPERVISORY CIRCUITS(VOLTAGE SUPERVISORS)
BQ2002C	NiCd/NiMH Charge Controller with Negative dV and Peak Voltage Detection Termination	BATTERY MANAGEMENT - BATTERY CHARGE MANAGEMENT	BATTERY CHARGE MANAGEMENT
Customers Who Evaluated This Product Also Evaluated...			
TMS320C6727B	Floating-Point Digital Signal Processor	C6000 FLOATING/FIXED-POINT DSPS-TMS320C672X DSPS	TI customers also evaluated this product.
TMS320DM642	Video/Imaging Fixed-Point Digital Signal Processor	DAVINCI VIDEO PROCESSORS-TMS320DM64X DSP GENERATION	TI customers also evaluated this product.
TMS320VC5509A	Fixed-Point Digital Signal Processor	TMS320C5000 DSP PLATFORM-TMS320C55X DSP GENERATION	TI customers also evaluated this product.
TMS320DM6446	DaVinci Digital Media System-on-Chip	DAVINCI VIDEO PROCESSORS-TMS320DM644x SOCs	TI customers also evaluated this product.
TMS320C6455	Fixed-Point Digital Signal Processor	TMS320C6000 DSP PLATFORM-TMS320C645x DSPs	TI customers also evaluated this product.
TMS320C6205	Fixed-Point Digital Signal Processor	TMS320C6000 DSP PLATFORM-TMS320C62X DSP GENERATION	TI customers also evaluated this product.
TMS320C6720	Floating-Point Digital Signal Processor	C6000 FLOATING/FIXED-POINT DSPS-TMS320C672X DSPS	TI customers also evaluated this product.
TMS320C6747	Floating-Point Digital Signal Processor	C6000 FLOATING/FIXED-POINT DSPS-TMS320C674X LOW POWER DSPS	TI customers also evaluated this product.
OMAP-L137	Low-Power Applications Processor	OMAP™ Applications Processors-OMAP-Lx Processors	TI customers also evaluated this product.
TMS320F28335	Delfino Microcontroller	C2000™ 32-BIT MICROCONTROLLERS-28X DELFINO™ FLOATING-POINT SERIES	TI customers also evaluated this product.
OMAP3530	Applications Processor	OMAP™ Applications Processors-OMAP35x PROCESSORS	TI customers also evaluated this product.
OMAP-L138	Low-Power Applications Processor	OMAP™ Applications Processors-OMAP-Lx Processors	TI customers also evaluated this product.

TMS320F2812	32-Bit Digital Signal Controller with Flash	C2000™ 32-BIT MICROCONTROLLERS-28X FIXED-POINT SERIES	TI customers also evaluated this product.
TMS320C6745	Floating-Point Digital Signal Processor	C6000 FLOATING/FIXED-POINT DSPS-TMS320C674X LOW POWER DSPS	TI customers also evaluated this product.
TMS320C6748	Fixed/Floating Point Digital Signal Processor	C6000 FLOATING/FIXED-POINT DSPS-TMS320C674X LOW POWER DSPS	TI customers also evaluated this product.
TMS320DM6467	Digital Media System-on-Chip	DAVINCI VIDEO PROCESSORS-TMS320DM646x SOCs	TI customers also evaluated this product.
TMS320C6474	Multicore Digital Signal Processor	TMS320C6000 DSP PLATFORM-TMS320C647X MULTICORE DSPS	TI customers also evaluated this product.

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Error: CCS 3.3 and DSK6713 Latest post by Jeff Lin, 30 Oct 2009 6:32 PM		3	108
QualiTI Error Latest post by Chris Ring, 30 Oct 2009 5:53 PM		1	13
Bios HWI Latest post by don, 30 Oct 2009 11:35 AM		2	44
the program is endless loop ,cannot back Latest post by Joe Coombs, 30 Oct 2009 11:25 AM		1	33
XDAIS on C672x Latest post by MeghaDaga, 27 Oct 2009 2:51 PM		15	531

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audio signal processing (2)
floating point dsp (2)
6713b (1)

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