Product Bulletin

TMS320DM64x™ Digital Media Processors

Key Benefits
- Choose the option that fits your needs – broad range of high-performance/low-cost options with the TMS320DM640, DM641 and DM642 digital media processors
- Rapidly develop products with the latest algorithms due to code compatibility and full software programmability
- Utilize any video standard – TMS320DM64x generation supports the latest industry standard algorithms including MPEG-4 AVC (H.264) encode and decode
- Get started today with TMS320DM64x DSP production qualified devices and the Digital Media Development Kit

The TMS320DM640, DM641, and DM642 digital media processors offer multimedia system designers:
- High-quality video ports with industry-leading performance based on proven TMS320C64x™ DSP core technology
- A time-to-market advantage through a complete range of ready-to-use application software
- Reduced system cost for video-over-IP applications through on-chip integration of key audio/video and connectivity peripherals
- Extensive design, software and systems support from TI and the industry's largest third-party network
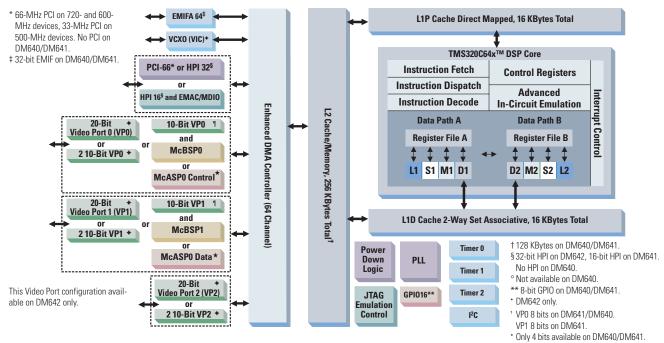
Price/Performance Options
At up to 720 MHz, the DM64x™ digital media processors offer industry-leading performance. For example, a single digital media processor can simultaneously decode up to four channels of MPEG-2 video, Main Profile at Main Level (MP@ML), D1 (720×480) resolution, at 30 frames per second.

The DM64x generation is based on TI's proven C64x™ DSP core, which contains instruction set extensions (VelociTI.2™) for accelerating video and imaging applications. Since the DM64x

TMS320DM64x DSP Generation Functional Block Diagram

The TMS320DM64x digital media processors offer high performance with low system cost options.

generation is fully software programmable, a customer's system can be upgraded from MPEG-2 video codec to H.264 video CODEC or other streaming media technologies. Upgrading a customer's video-on-demand set-top box from MPEG-2 video to H.264 video standards can double the service provider's channel capacity and double the consumer's hard disk drive storage capacity while maintaining video quality.

Optimized for Emerging Video-Over-IP Applications

The TMS320DM64x™ generation was designed to meet the needs of several end-equipment applications including:

- IP-based video recorders
- Set-top boxes
- Security surveillance
- Network cameras
- Digital video recorders with the right level of peripheral integration and performance for the lowest-cost implementation
- Encoding and decoding flexibility for the latest industry standards and proprietary codecs
- High-performance imaging applications that require multi-function processing

  In each of these applications, the DM64x generation offers real advantages with peripherals geared for these markets.

Integrated Multimedia Peripherals

The integrated video ports connect directly to industry standard video encoders and decoders, eliminating the need for glue logic. The ports support multiple resolutions and standards including CCIR601, ITU–BT.656, BT.1120, SMPTE 125M, 260M, 274M and 296M. The DM642 has three video ports. Each video port is 20 bits wide and can be configured as one 20-/16-bit channel or two 10-/8-bit channels. The DM641 has two 8-bit video ports. The DM640 has one 8-bit video port. The ports can also be configured as video capture, video display or raw mode capture. The video ports also include support for format conversion and horizontal scaling.

Multichannel Audio Serial Port

The multichannel audio serial port (McASP) functions as a general-purpose audio serial port optimized for the needs of multi-channel audio applications. The DM642 McASP provides support for 16 single channels or eight stereo lines. The serial data pins can be configured as transmit or receive. The McASP supports the common industry-standard serial interfaces. The McASP is useful for both inter-integrated sound (IIS) protocols and inter-component

digital audio interface transmission. Key features include two independent clocks for transmit and receive, support for a wide variety of IIS and similar bit-stream formats and the digital audio interface transmitter (DIT). The DIT supports SPDIF, IEC60958-1, AES-3 and extensive error checking and recovery.

Integrated Connectivity Peripherals

10/100 Ethernet MAC

This peripheral allows easy connection to IP-based, packet-switched networks. It is compliant with industry-standard PHY interfaces and supports multiple data flows on multiple transmit (TX) and receive (RX) data channels. TCP/IP network protocol stack software is available from TI third-party partners.

66-MHz PCI (DM642 Only)

The 66-MHz PCI connects directly to a PCI bus and facilitates rapid system integration.

World-Class Development Support

TI supports the DM64x™ generation with the world's most comprehensive development tool suite, including:

- Code Composer Studio™ Development Tools
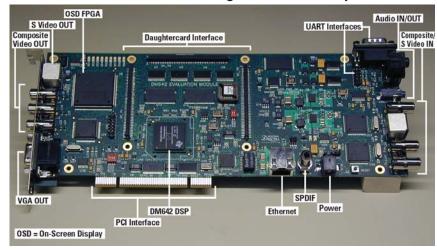- DSP/BIOS™ software kernel foundation

- ImageLIB—an optimized library of video and imaging functions
- Reference Frameworks for easy integration of codecs
- TMS320™ DSP Algorithm Standard for eXpressDSP™ software allows customers to mix and match algorithms and software components from different providers

Additionally, customers can start development on TI's Digital Media Development Kit (see figure) and take advantage of an extensive range of system solutions from TI's Third Party Network—the industry's most wide-ranging and complete network for developing high-performance DSP applications.

One-Stop Shopping for Video Components

Glueless interfacing to the main system components in video applications is one of the goals of the TMS320DM64x™ generation. With glueless connection to video codecs and data-conversion providers, the device greatly reduces design complexity and cost. Designers can utilize TI's high-performance, digital-media, mixed-signal portfolio to complement and complete digital-media application designs. Products include:

Hardware Board Included in TI's Digital Media Development Kit

The Digital Media Development Kit is available today. See the website for more information.

TVP5150—The TVP5150 is an ultra-low-power NTSC/PAL composite and S-video decoder in the smallest video decoder footprint available today (32-pin TQFP), making this device ideally suited for portable video applications. The device outputs standard 8-bit ITU-R.BT656 video with embedded syncs or, alternatively, component video output with dedicated sync.

The DM642 Evaluation Module (EVM) is a low-cost high-performance video and imaging development platform designed to jump-start application development and evaluation of multi-channel, multi-format digital and other future proof applications. Leveraging the high-performance TMS320C64x™ DSP core, this development platform supports TI's TMS320DM642, DM641 and DM640 digital media processors. For more information, visit **www.ti.com/dmdk**

For More Information

If you would like more information on how the DM64x™ digital media processors can help make your next digital media system a success, please contact your local TI field sales office (see last page). Or, visit: **www.ti.com/dm64xpb**

TMS320DM64x™ DSP Generation – Video Application-Specific Fixed-Point DSPs

Part Number	Internal RAM (Bytes) L1 Program Cache/ L1 Data Cache/ L2 Unified RAM/Cache	Video Ports	McBSP	Enhanced DMA (Channels)	COM°	Timers	MHz	MIPS	Power (W) CPU and L1‡	Total⁺	Voltage (V) Core	I/O	Packaging	1 KU ($U.S.)⁺
Video Application Specific														
TMS320**DM640**GDK400	16K/16K/128K	1 8-bit	2	64	EMAC	3	400	3200	0.264	1.15	1.2	3.3	548 BGA, 23 mm	22.54
TMS320**DM640**GNZ400	16K/16K/128K	1 8-bit	2	64	EMAC	3	400	3200	0.264	1.15	1.2	3.3	548 BGA, 27 mm	22.54
TMS320**DM641**GDK500	16K/16K/128K	2 8-bit	2	64	HPI 16/EMAC	3	500	4000	0.33	1.3	1.2	3.3	548 BGA, 23 mm	30.77
TMS320**DM641**GNZ500	16K/16K/128K	2 8-bit	2	64	HPI 16/EMAC	3	500	4000	0.33	1.3	1.2	3.3	548 BGA, 27 mm	30.77
TMS320**DM641**GDK600	16K/16K/128K	2 8-bit	2	64	HPI 16/EMAC	3	600	4800	0.558	1.9	1.4	3.3	548 BGA, 23 mm	33.84
TMS320**DM641**GNZ600	16K/16K/128K	2 8-bit	2	64	HPI 16/EMAC	3	600	4800	0.558	1.9	1.4	3.3	548 BGA, 27 mm	33.84
TMS320**DM642**GDK500	16K/16K/256K	3 20-bit	2§	64	PCI/HPI 32/EMAC†	3	500	4000	0.33	1.3	1.2	3.3	548 BGA, 23 mm	42.89
TMS320**DM642**GNZ500	16K/16K/256K	3 20-bit	2§	64	PCI/HPI 32/EMAC†	3	500	4000	0.33	1.3	1.2	3.3	548 BGA, 27 mm	42.89
TMS320**DM642**GDK600	16K/16K/256K	3 20-bit	2§	64	PCI/HPI 32/EMAC†	3	600	4800	0.558	1.9	1.4	3.3	548 BGA, 23 mm	48.25
TMS320**DM642**GNZ600	16K/16K/256K	3 20-bit	2§	64	PCI/HPI 32/EMAC†	3	600	4800	0.558	1.9	1.4	3.3	548 BGA, 27 mm	48.25
TMS320**DM642**GDK720	16K/16K/256K	3 20-bit	2§	64	PCI/HPI 32/EMAC†	3	720	5760	0.67	2.15	1.4	3.3	548 BGA, 23 mm	67.79
TMS320**DM642**GNZ720	16K/16K/256K	3 20-bit	2§	64	PCI/HPI 32/EMAC†	3	720	5760	0.67	2.15	1.4	3.3	548 BGA, 27 mm	67.79

§ The DM642 can be configured to have up to three serial ports in various video/McASP/McBSP combinations.   Note: Enhanced plastic and Military DSP versions are available for selected DSPs.
† The DM640 has an Ethernet MAC. The DM641 can be configured to have either a 16-bit HPI or Ethernet MAC. The DM642 can be configured to have either a 32-bit PCI or 32-bit HPI or a 16-bit HPI and Ethernet MAC.   ° HPI is selectable, 32-bit or 16-bit.
⁺ Prices are quoted in U.S. dollars and represent year 2005 suggested resale pricing. All prices are subject to change. Customers are advised to obtain the most current and complete pricing information from TI prior to placing orders. TI may verify final pricing prior to accepting any order.   ‡ Assumes 60% CPU utilization.
✦ Assumes 60% CPU utilization, 50% EMIF utilization (133 MHz for 1.4 V, 100 MHz for 1.2 V), 50% writes, 64-bits, 50% bit switching, 2 2-MHz McBSP at 100% utilization, and 2 50-MHz timers at 100% utilization. See SPRA962.

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TI Semiconductor Product Information Center Home Page
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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 54 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
Russia	+7 (0) 95 363 4824
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
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	<u>Toll-Free Number</u>
Australia	1-800-999-084
China	800-820-8682
Hong Kong	800-96-5941
Indonesia	001-803-8861-1006
Korea	080-551-2804
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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
	ti-china@ti.com
Internet	support.ti.com/sc/pic/asia.htm

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