TMS320DM642
Industry’s Highest Performance, Software Programmable
600-MHz Digital Media Processor

Complete with ready-to-use application software and development tools for starting designs today

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Distinguished Member of Technical Staff, DSP Video Imaging

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Worldwide Strategic Marketing, DSP Video Imaging
Presentation Outline

- Digital Media Market
- TI Innovation
- Digital Media Solutions: Hardware, Software, & Systems
- The DM642 Digital Media Processor
- Digital Media Applications
- Competition
- Application Performance
- Ready-to-Use Software
- Get Started Today
- Roadmap
- Summary
## Digital Media Market Requirements

<table>
<thead>
<tr>
<th>Service Provider Needs</th>
<th>OEM Needs</th>
<th>DM642 Digital Media Processor</th>
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<tbody>
<tr>
<td><strong>New revenue sources</strong></td>
<td><strong>Multiple applications</strong></td>
<td><strong>New Capabilities</strong></td>
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<td><strong>New services</strong></td>
<td>Quality and performance</td>
<td>Any content, anytime</td>
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<td></td>
<td>Reduced system cost</td>
<td>Entertainment on demand</td>
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<td></td>
<td>Cool running systems</td>
<td>Video over IP</td>
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<td></td>
<td>Network connectivity</td>
<td>Video optimized DSP core &amp; input/output</td>
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<td><strong>Interactivity</strong></td>
<td><strong>Reduced time-to-market</strong></td>
<td><strong>Tailored Software &amp; Development Systems</strong></td>
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<tr>
<td><strong>Upgrade flexibility</strong></td>
<td></td>
<td><strong>Third-Party Network</strong></td>
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</table>

- Online codec upgrade: We have doubled your channels
- Upgrade flexibility

**Third-Party Network**

- Real World Signal Processing™
- Texas Instruments
Growing Video and Imaging Market Fueled by TI Innovation

Over 500 IDKs shipped-to-date

MPEG-4

100s of designs in video applications using TI’s C6000™ DSP Platform (14 devices available)

H.26L

Portable Media Platform DM310 announced

University of Washington C64x™ Media Processing Consortium

Development board

TI Announces DM642

..more

C64x™ device samples available with video instruction set extensions

RV8 decoder

Portable Media Platform C64x™ released

Imaging Developer’s Kit Launched

eXpressDSP™ SOFTWARE & DEVELOPMENT TOOLS

REAL WORLD SIGNAL PROCESSING™

Texas Instruments
TI Delivers Digital Media Solutions

- High-performance DSP core
- Instruction Set Architecture optimized for video processing
- Video-optimized I/O
- Multi-Channel Video and Audio IP Connectivity
- Standard Bus Interface

Complete, Ready-to-Use Application Software

- MPEG-2
- MPEG-4
- H.263
- JPEG
- MP3
- JPEG2000

Cutting Edge System Solutions for Video

- VOD, IP-based video phone, DVR

Real World Signal Processing™

Texas Instruments
DM642 — Highest Performance With On-Chip Video and Audio Integration

600/500 MHz DSP Core at 1.4/1.2 volts
- Industry-leading performance in 0.13 µm copper process

Three Dual-Channel Video Ports
- Two video channels per port—software configurable as input or output
- Video filtering, horizontal scaling
- Glueless interface to video system components
- Support BT656, digital TV formats (SDTV and HDTV), raw video I/O
- 8-bit/10-bit/16-bit/20-bit video support per port

McASP
- Multichannel audio serial port
- Up to 8 stereo lines (16 channels)

10/100 Ethernet MAC
- Connects to IP packet networks

66 MHz PCI
- Connects to backplane chassis or PCI bus

23 x 23 mm² flip-chip BGA package
- Maximizes channel density
DM642 Optimizes Typical DVR System

Current Solution

DM642 Processor Solution

- Eliminate 10 ICs
- Reduced Bill of Materials
- Reduced Manufacturing Cost
- Single Processor System
- Reduced Time-to-Market
DM642 Digital Video Recorder Application

- Glueless interface for 4 channels of camera video input (BT656)
- Glueless interface for local monitor video output (BT656)
- Glueless interface for transmitting compressed data stream over ethernet
- Glueless interface for audio I/O
- Processing power for multichannel video encode (MPEG-4, JPEG)
DM642 Enables High-Quality, Multi-Channel, Multi-Format VOD Applications
DM642 Enables High-Quality, Multi-Channel, Multi-Format VOD Applications

DM642 Media Processor Solution

- SDRAM
- Flash
- DM642 Media Processor
- Video Encoder
- Audio DAC
- Cable or DSL

Middleware Software
- Onscreen display
- Internet browser
- Media player
- Encryption

Streaming media decode (MPEG-4/H.26L)

MPEG-2 Decode

Headroom

Broadband Set Top-Box

DM642 Processor Load

TI Cable Modem

Or TI DSL Modem

Cable Tuner

TI Cable Modem

DM642 Enables High-Quality, Multi-Channel, Multi-Format VOD Applications
DM642 Offers Performance for Multi-Channel Video Processing

Optimal real-time video performance
- Three channels H.263 decode at 30 fps
- Video sync to voice
- Video packetization
- Video scaling

Speech Processing
- Codecs suite (e.g., G.723.1)
- Echo Cancellation

System Stack & Networking Support
DM642 Enables High-Quality Real-Time MPEG-2 Encoding in Software

High-Performance MPEG-2 Encoding
- Real-time full D1 resolution
- Not limited to low bitrate
- Full use of field and frame prediction
- Wide effective motion search range
- Optimized for intelligent combinations of motion search algorithms

Most Flexible
- Scalable across multiple applications
- Adaptable to content source and target bitrate
- Optimal transcoding and transrating including type1, type2, type3, and recoding approaches

Optimized Source Code Planned for Availability
- Allows focus on differentiated IP

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<tr>
<th>D1 MPEG-2 Main Profile @ Main Level Video Encode (MP@ML)</th>
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<tbody>
<tr>
<td>Film source encode</td>
<td>60%</td>
</tr>
<tr>
<td>Interactive video encode</td>
<td>67%</td>
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<tr>
<td>Encode for video editing</td>
<td>47%</td>
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<tr>
<td>Video encode for security monitoring</td>
<td>47%</td>
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<tr>
<td>General purpose video encode (customizable for applications)</td>
<td>97%</td>
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</table>
Ready-to-Use Now

**Streaming Media Partners**
- Real
- Windows Media Technologies
- On2

**VP4/VP5 codecs with encryption support**

**Third-Party Software**
- ubvideo
- ATEME
- Imagine Technology
- Telphi

- H.263 (incl. annexes), H.26L
- JPEG-2000, Video compression
- JPEG, M-JPEG
- Algorithm library and media processing consortium

**Foundation Software**
- eXpressDSP™ Software
- Code Composer Studio™ IDE
- DSP/BIOS II™ RTOS
- Reference Frameworks
- DSP Library, Image Library

More than 600 eXpressDSP compliant algorithms at www.dspvillage.com

**Real World Signal Processing™**

**Texas Instruments**
Start Development Today

C64x™ DSP
Network Video Developers Kit (NVDK)

- ATEME™ C6416 video board
- 10/100 Mbps Ethernet daughter card
- Audio/video interface box

Basic NVDK
TI Part Number: TMDX3263C6416/E
Suggested retail price: $4,495
www.dspvillage.com

eStore Bundle With Emulator & Code Composer Studio
TI Part Number: NVDKCCS/E
Suggested retail price: $5,995
www.ti.com/nvdk_kit

Technical Documentation
- DM642 product preview datasheet
- DM642 technical brief

Real World Signal Processing™

Texas Instruments
eXpressDSP™
Premier, Open, Real-Time Software Environment

Powerful Code Composer Studio™ Developers Toolbox

Re-Useable eXpressDSP™ Software
DSP/BIOS, TMS320 Algorithm Standard, Reference Frameworks

Largest DSP Third-Party Network

100K seats shipped since 1999!

>600 algorithms from 100 unique 3rd parties

80% of new designs choose DSP/BIOS™

>500 companies in Third-Party Network
Digital Media Solutions Silicon Roadmap

DM642 Continues Long-Term Commitment to Deliver Higher Integration and Performance

Software Compatible

- C64x™ DSP Video Infrastructure
- Co processing engines
  High-bandwidth I/O
  Multi-C64x DSP cores
- Tailored peripherals and memory mixes
- DMC64x™ DSP

Announcing DM642
500/600 MHz

Samples: 2Q03
Production: 4Q03

1st Generation
C62x™ DSP
10 Devices

2nd Generation
C6414/15/16 DSP

C6411 DSP

Roadmap
In development
Available today

Real World Signal Processing™
Texas Instruments
## TI’s Broad Video and Imaging Portfolio

<table>
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<tr>
<th>High-Perf. Digital Media</th>
<th>TMS320C6000™ DSP platform for video client and infrastructure applications</th>
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<tr>
<td></td>
<td>DM642 Digital Media Processor</td>
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<tr>
<td>Portable Digital Media</td>
<td>TMS320C5000™ DSP and OMAP platforms</td>
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<td></td>
<td>- DSC21, DSC24, DSC25 SoCs for DSCs</td>
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<td></td>
<td>- DM310 Digital Media Processor</td>
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<td></td>
<td>- OMAP5910 Dual core, RISC/DSP processor</td>
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<td>Analog</td>
<td>TVP5200 first all-format video processor</td>
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<td>TVP5145 Best-in-class mixed-signal decoder for video applications</td>
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<td></td>
<td>THS8200 all format video backend for video &amp; PC applications</td>
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<td></td>
<td>Other high-performance data converters and power management products</td>
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<td>Complementary TI Technologies</td>
<td>DSL Modems</td>
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<td>Cable Modems</td>
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<td>Wireless LAN</td>
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Hundreds of products available today, Hundreds of video and imaging products in production today
TI Announces:

The highest performance, software programmable, Digital Media Processor

**Raises the bar over other programmable media processors**

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<tr>
<th>Applications performance</th>
<th>System integration</th>
<th>Ready to use application software</th>
<th>System solutions</th>
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<tr>
<td>2x performance _ power consumption Fully SW upgradeable</td>
<td>Lower cost BOM HD Video ports Ethernet MAC</td>
<td>All standards</td>
<td>Leverage existing core Leverage existing code Leverage existing tools</td>
</tr>
<tr>
<td>New capabilities New services New features</td>
<td>Optimized for target systems Differentiated features</td>
<td>First to market with codecs</td>
<td>Reduced development time</td>
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</table>

Start Today!

**REAL WORLD SIGNAL PROCESSING™**