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DaVinci

# DaVinci™ -Based Products: TMS320DM365 Digital Media Processor

## **What is the TMS320DM365 digital media processor?**

The new TMS320DM365 digital media processor based on DaVinci™ technology provides pixel perfect images with HD video up to 1080p. Unlike other processors available on the market, the ARM9-based DM365 device offers production-qualified H.264, MPEG-4, MPEG-2, MJPEG and VC1 codecs providing customers with the video flexibility to select the right format for their application. By offering to the mass market as part of the DaVinci technology portfolio of products, TI has the opportunity to reach new segments within the digital video market.

Key benefits of the DM365 processor include:

- Multi-format HD video with H.264 up to 1080p
  - 1080p H.264 at 10 fps optimized for video surveillance
  - 1080p MPEG-4 at 24 fps
  - 720p H.264, MPEG-4 at 30 fps
- Flexibility without complexity
  - Integrated Image Signal Processing (ISP)
  - Multi-format, multi-rate, multi-stream, multi-channel
  - Production-ready codec bundles
- Up to 25 percent system cost savings
  - Peripheral integration
  - ISP allows use of less-expensive optics to get higher-quality images

## **For what applications is the DM365 processor best suited?**

- Multi-channel DVR
- Digital signage
- HD web cam
- Video doorbell
- IP security camera
- Personal media player
- Video baby monitors

***What are the key market drivers for this device?***

Customers are looking for: HD multi-format video (especially H.264), advanced image processing for high-quality video, multimedia and connectivity. H.264 algorithms offer great compression to ensure the lowest bandwidth and network storage and the faster download times.

***What is the availability of the DM365 digital media processor?***

March 3, 2009.

***What are the benefits end users can look forward to based on this technology?***

With multi-format HD video, consumers experience higher-quality video resolution on their portable or plugged devices. Additionally, due to the integrated peripherals and lower system BOM costs, end users have smaller devices that have the ability to play back any video. Additionally, security and camera-driven devices are able to handle multi-channel, multi-stream and multi-rate video to fit their work or household needs.

***How is this different from the DM355 processor?***

The DM365 processor is an extension of the popular TMS320DM355 device. The DM365 processor adds additional features and system integration including H.264, EMAC, RTC, voice codec and two additional DACs.

***What are the technical specs for the processor?***

The DM365 processor contains:

- Cores
  - An ARM926EJ-S™ core running up to 300 MHz
  - H.264 co-processor (HCP)
  - MPEG-4 and JPEG co-processor (MJCP)
  - Video processing subsystem (VPSS) with integrated image signal processing (ISP)
- Memory
  - ARM: 16-KB I-Cache; 8-KB D-Cache; 8-KB ROM; 32-KB program/data
- Peripheral highlights
  - USB 2.0 HS device and mini-host with PHY
  - EMAC
  - Real-time clock (RTC)
  - Audio/voice codec

- Keyscan/ADC
- 16-bit DDR2
- Three DACs
- Package:
  - 13 × 13 mm, 0.65-mm pitch

***What is included with the development tool?***

The DM365 Digital Video Evaluation Module (TMDXEVM365) development tool includes:

- MontaVista Linux preliminary demo, version 5.0 (2.6.18 kernel initially)
- Drivers for UART, I<sup>2</sup>C, SPI, EDMA, NAND, MCC, SD card, USB host/gadget, VPSS (display, capture, CCDC, resizer, previewer), OSS audio (McBSP), GPIO, PWM, WDTIM
- Uboot loader
  - H.263/JPEG/MPEG-4 SP/G.711 codecs
- Video Input/Output, Audio In/Out, UART, external EMAC, USB 2.0, JTAG
- Freely available ORCADs, schematics

***What operating systems does the DM365 processor support?***

Linux and will support Windows<sup>®</sup> Embedded CE by 2H09.

***What software comes with the processor and/or EVM?***

Royalty-free, production-ready codec bundles that include MP3, G.711, H.264, MPEG-4 and JPEG. For further flexibility, premium audio (AAC, WMA and AEC) and video codecs (MPEG-2, VC1 and WMV9) bundles are available.

***Since software is included with the processor, if your customers are using it for something other than video, would you encourage that?***

Sure. TI is always interested in seeing what our customers do with the technology we provide them. This is one of the best ways to see innovation in the market and we have no interest in trying to limit our customers.

### ***What is the pricing of the new product lines?***

The DM365 processor at 270 MHz is priced at U.S. \$21.20 at 100 units.

### ***The ISP was not included on the DM355 processor?***

The DM355 processor also has the ISP, but what TI has done with the DM365 processor is exposed the tools for the broader market and enhanced the ISP by adding additional capabilities such as face detection to help developers achieve higher-quality video.

### ***What is the anticipated power consumption on this device? And how does it compare to the DM355 processor?***

The DM365 processor is currently at 850 mW for full HD encode/decode. This runs a little higher than the DM355 processor but the DM365 processor is a more powerful chip and is still ideal for portable devices.

### ***Who are the current TI Developer Network members that support the DM365 device?***

The developers include, but are not limited to:

- Z3 Technology
- Spectrum Digital
- Leopard Imaging
- eSol
- MPC Data
- Nuvation

### ***What TI Analog parts complement the DM365 processor?***

A broad portfolio of Analog components is available to address low power and performance. For more information, visit [www.ti.com/processorpower](http://www.ti.com/processorpower).

### ***Why is this solution a better offering for the customer?***

Linux and ARM® users can now access TI's proven offerings and technology. It's an entry point for these customers who previously did not have DSP expertise to take advantage of all that DaVinci™ technology and TI have to offer.

Also, by offering an ARM + accelerator device as part of the DaVinci technology portfolio, these customers will now have access to this easy-to-use, integrated digital video platform that supports the development of virtually all digital-video applications. DaVinci technology significantly reduces design cycles, development costs and the amount of customization required to produce innovative digital-video end equipments. The standardized codecs and APIs make it easier for OEMs to develop interoperable code that will work

with other DaVinci™-based applications, simplifying future development efforts. DaVinci support also includes application-specific development tools, such as development platforms and reference designs for OEMs to speed their time to market. The integration of DaVinci processors will also provide significant cost reductions for final products.

***What is the Ethernet rate when encoding at such high frame rates?***

When encoding 720p at 30 fps with H.264, files can be received at 3 Mbits per second. So, for an EMAC 10/100, there shouldn't be any delay/issues.

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Digital Control	<a href="http://www.ti.com/digitalcontrol">www.ti.com/digitalcontrol</a>
Medical	<a href="http://www.ti.com/medical">www.ti.com/medical</a>
Military	<a href="http://www.ti.com/military">www.ti.com/military</a>
Optical Networking	<a href="http://www.ti.com/opticalnetwork">www.ti.com/opticalnetwork</a>
Security	<a href="http://www.ti.com/security">www.ti.com/security</a>
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