



## **October 16, 2007 – Webcast: Designing Portable HD Video Applications with New Low-Cost DaVinci™ DM355 Processor**

### **Attendee Submitted Questions and Answers**

#### **1. For what applications is the DM355 best suited?**

- Digital cameras
- Digital photo frames
- Low-power IP netcams
- Video doorbells
- Video baby monitors
- Portable media players and other A/V portable players
- Low-priced GPS/Satellites
- Camcorders
- Ultra low-cost 4-channel DVRs
- IP security cameras
- Portable test equipment

#### **2. What are the key market drivers for this device?**

There is a growing demand for high-definition video capture and playback in handheld devices at consumer price points. OEMs and ODMs are looking for a complete solution that will enhance their products, keep them affordable and reduce time-to-market.

#### **3. What is the availability of these products?**

Silicon will be TMS & order entry is now open for the DVEVM and DVSPB. The devices will reach production volume in 1Q08.

#### **4. What are the technical specs for the processor?**

The DM355 contains:

- An ARM926EJ-S™ core running at 215 MHz
- A Video Image Coprocessor running at 215 MHz
- Memory on ARM of 16KB I-Cache; 8KB D-Cache; 8KB ROM; 32KB program/data

- Peripheral highlights include the Video Processing Subsystem with resizer, image processing engine, 16-bit digital input, integrated OSD, one video DAC, 16-bit digital YCbCr output
- USB 2.0 HS device and mini-host w/ PHY
- And a variety of other peripherals
- In a package of: 13 x 13 mm BGA, 329 pin, 0.65mm pitch

**5. Which operating systems does the DM355 support?**

The DM355 supports Linux and Windows® CE. Linux support is available from MontaVista. Logic Product Development is offers support for Windows CE.

**6. What is the anticipated power consumption on this device?**

<400mW for HD Video encode (720p)  
 ~ 1mW standby power, deep sleep mode

**7. Why are you introducing an ARM-based processor?**

We are dedicated to meeting the needs of our customers and one thing we've been hearing from them is that they want and need to be able to create scaleable product lines, within which they have can have similar products at varying levels of functionality and price. By offering the DM355 processor and EVM, we've made is easier for our customers to do this.

This device includes the same Video Processing Subsystem as all DaVinci processors to help offload the processing required by the ARM. It also includes an MPEG JPEG co-processor (MJCP) which handles the heavy lifting of the video processing. Thus the ARM, whether you have the 216 MHz or 270 MHz device, will be free to handle features such at the audio processing, user interface, networking, etc.

Finally, the ARM architecture allows the enormous number of open source Linux developers to reuse their IP on this device.

**8. How is the DM355 a DaVinci device when it has a different architecture from the DM644x and DM643x devices?**

DaVinci technology represents TI's complete offering for digital video applications, and we recognize that different video applications have different processing requirements. Through DaVinci technology, we have offers a range of processing architectures for our customers to select from and all are wrapped with DaVinci software, development tools and support.

**9. What if customers want the flexibility of a DSP?**

TI has a strong heritage in digital signal processing and offering our customers the most robust products possible by whatever means necessary. TI is committed to digital video processing by offering a variety of devices that meet the needs and demands of our customers so that they can develop the most advanced and varied digital video end equipments possible. If they need more flexibility than the DM355

offers, there are other architecture options in the DaVinci portfolio that they should consider.

**10. Do you think ARM is what the video market is moving toward?**

The popularity of ARM as a host processor for a variety of multimedia applications is well established. For the math-intensive processing required by digital video applications, there is a clear advantage to leverage DSP architecture or DSP-based accelerators to handle the video processing.

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

The DM355 EVM (TMDXEVM355) development tool includes:

- MontaVista Linux demo version 4.0 (2.6.10 kernel initially)
- Drivers for UART, I2C, SPI, EDMA, NAND, MCC, SD Card, USB Host/Gadget, VPSS (Display, Capture, CCDC, Resizer, Previewer), OSS Audio (McBSP), GPIO, PWM, WDTIM
- Uboot loader
- JPEG/MPEG 4 SP/G.711 Codecs
- Video Input/Output, Audio In/Out, UART, External EMAC, USB 2.0, JTAG
- Freely available ORCADs, schematics

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

The DM355 processor includes royalty and license-free MPEG-4 and JPEG on the chip. All the customer needs to do is sign a click-wrap license to install the software component of these codecs. For production, they will have to pay royalties to MPEG-LA. G.711 for ARM will also be provided free of charge with the click-wrap, which is part of the DM355 DVEVM.

**13. 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. By making this part available to the mass market, we are eager to see how our customers will innovate with it.

**14. Are there any advantages to buying the DVSPB during the evaluation stage instead of waiting for production?**

The main differentiator between a DVEVM and DVSPB is that the DVSPB comes complete with a full production version of MontaVista Linux, plus one-year of access to MontaVista Zone. During that year, users are entitled to all updates and versions of MontaVista Linux. The DM355 DVEVM is required in order to use the software provided in the DVSPB. While evaluating the DM355 processor, the demo version of MontaVista Linux included with the DVEVM should give most users the experience they need in order to make the decision to proceed to production.

**15. What happened to the DVSDK TI used to sell?**

TI now offers two versions of the DVSDK: a DSP/BIOS™ kernel version compatible with DaVinci DSP-based processors and a Linux-based version that supports DaVinci ARM9-based processors. A DVSDK is included in all DaVinci technology development tools, such as the DVDP, DVSPB and DVEVM products.

The DVSDK includes all of the following:

- TI video, imaging, speech and audio codecs
- Custom codecs that comply with TI's eXpressDSP™ Digital Media (xDM) algorithm standard
- Demonstration versions of popular video codecs to enable developers to benchmark and evaluate performance parameters
- Multimedia Application Programming Interfaces (APIs)
- TI's Codec Engine framework (Audio/Video)
- DSP/BIOS™ real-time kernel
- TI DSP/BIOS Link interprocessor communication technology (available in the Linux-based DVSDK)
- MontaVista demonstration software (available in the Linux-based DVSDK)

## RidgeRun Questions

### 1. Why is RidgeRun such an active supporter of the DM355 and DaVinci technology?

The majority of RidgeRun's product and services business is in support of customers building consumer electronics or media-based products. The DM355 has accelerated media characteristics along with an ARM® core which enables a wide range of products

### 2. What applications does RidgeRun imagine would use the DM355 processor?

Both the SOC and EVM are low-cost and low-power which fit well with the challenges in the consumer electronics market for portable devices. It is easy to imagine this device in portable media systems from media players, to digital photoframes, to IP TV oriented devices. All sorts of Video camera implementations would also benefit from the DM355 features.

### 3. What are RidgeRun's current and near-term product releases for this processor?

RidgeRun is already offering a Free SDK that can be downloaded from [www.ridgerun.com](http://www.ridgerun.com). This system is designed to leverage the capabilities of the TI DM355 EVM and provide a small-footprint implementation for customers looking to start a product offering on the EVM board and later transition to their own hardware design.

RidgeRun also currently offers a "Developers SDK" which provides a more robust development toolkit including profiling tools, additional device drivers, and ported

open source applications to make product development fast.

RidgeRun's "Media SDK", the first of several SDKs will be available very soon and will support all sorts of streaming media products implementations.

RidgeRun has also just announced a network based digital photoframe reference application. This reference application enables a 90%+ solution for an entire software application stack for ODM's or OEM's looking to produce network enabled photoframes on the TI DM355 or other TI ARM-based processors.