MPEG-2 Main Profile Decoder

CAPABILITY SUPPORTED (V1.00) FEATURES

- **MPEG-2 (MP@HL) of ISO/IEC 13818-2**
- **Compliant Per ISO/IEC 13818-4, Based on Inverse Discrete Cosine Transform (IDCT)**
- **YUV 420 Planar and YUV 422 Interleaved Output Formats**
- **Supports a Maximum of Three Quantization Tables**
- **Supports Interlaced and Progressive Decoding**
- **Tested for 720P (60 Frames Per Second) and 1080I (60 Fields Per Second) Decoding in File-To-File Tests. Actual HD Decode Performance in Real Systems Will Require System Level Optimization of Drivers and Codec Execution Framework to Achieve These Resolutions in Practice.**
- **Supports Only Elementary Video Stream Input Formats**
- **Supports MPEG-1 Constrained Parameters Bit-Streams (CPB)**

BACKGROUND

The MPEG-2 standard was initially developed by the Moving Picture Experts Group (MPEG). The standard allows text and other data to be added to video and audio data streams. It is widely used to specify the format of the digital television signals that are broadcast by terrestrial, cable, and direct broadcast satellite TV systems. It also specifies the format of movies and other programs that are distributed on DVD and other similar disks..

DESCRIPTION

TTexas Instruments MPEG-2 decoder software is a proven module that allows for digital video decoding. The ready-to-implement MPEG-2 decoder reduces time-to-market because it can be easily integrated into a design without writing or debugging software. It conforms to the MPEG-2 standards approved by the International Standards Organization (ISO) and the International Electrotechnical Commission (IEC).

The MPEG-2 Main Profile (MP) D1 decoder is xDM compliant for video decoding applications. It is available in system tested codec combinations with a codec engine, DSP/BIOS, DSPLink and Framework components. The MPEG-2 combination includes MP3 decode in audio/video example applications and other example combinations are planned for the future..

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Software Architecture

2 WWW.TI.COM/DIGITALMEDIASOFTWARE DSKT MEM, TSK API The overall software architecture for the DaVinci Technology-based TMS320DM644x processor is shown in Figure 1. TI digital media encoders and decoders seamlessly plug into the signal processing layer architecture; the right side of the above diagram. The codec engine framework includes code for different classes of TI eXpressDSP digital media software. It connects to the application layer and exposes user control through the VISA API; a high level interface that allows developers to control and operate the software from a high level Operating System (OS) environment. TI digital media codecs, such as the MPEG-2 decoder, allow developers to focus design efforts on differentiating features at the application layer, while DaVinci's open software environment allows developers to include differentiating IP on any of the DSP, application, or IO layers shown above. For more information on TI software architecture, please reference the following technical documents:

- MPEG-2 Video Decoder: TMS320C62x™ DSP Implementation

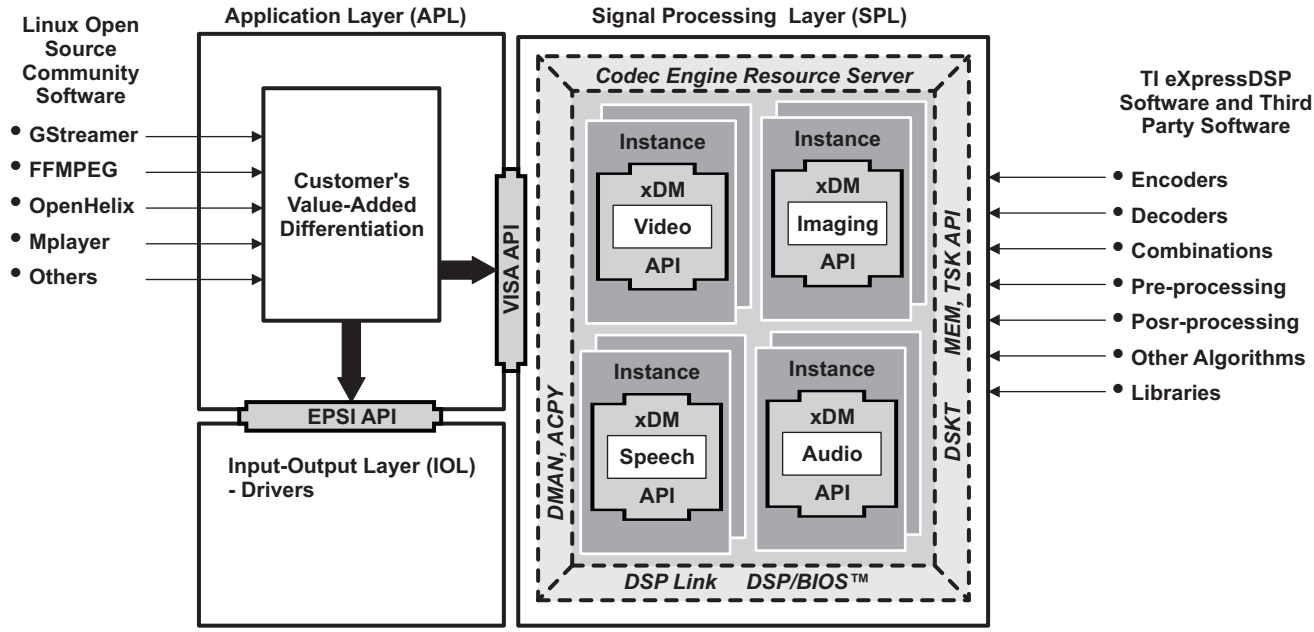

Figure 1. Software Architecture

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Commonly Used Terms:

API – Application Programming Interface

DMAN – Direct Memory Access Manager

EPSI – Easy Peripheral Software Interface

MEM - Memory

TSK – Task

VISA – Video Imaging Speech Audio

xDM – eXpressDSP Algorithm Interoperability Standard for Digital Media

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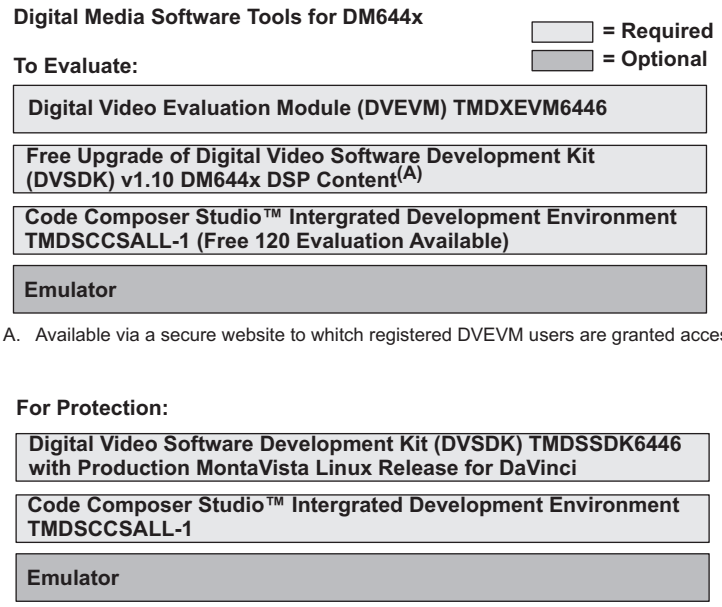

Figure 2. Required Tools

Performance Summary

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Table 1. Performance Summary

Criteria	PERFORMANCE
MIPS	• 170 MHz Typical (v1.00) • 220 MHz @ D1
Memory	• 2360 kB External • 62 kB Internal Data • 130 kB Program
Memory IO	• MP D1 218 megabytes/second

Availability and Pricing

- Available stand alone or in codec combinations
- Available now, v1.00
- Price: Up front fee $10,000 + $.50 per unit royalty @ 10 KU – for further pricing information, contact your TI representative or visitwww.ti.com/digitalmediasoftware.

Future Features

- Error resiliency - bounds checking/robustness
- Trick play and reverse play support
- Bottom field reordering in case of non-progressive sequences where bottom field is sent ahead of top field for frame pictures
- Display Width feature
- Streams which are non-multiples of 16
- Feature XDM_PARSE_HEADER, allows parsing of only headers, skipping picture data decoding

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