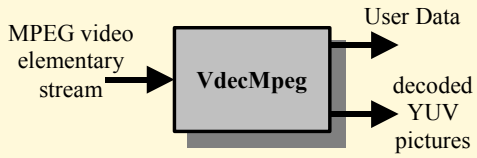
Philips Semiconductors

MPEG-1 and MPEG-2 Video Decoder, a TSSA Software library for decoding MPEG video elementary bitstreams on TriMedia processors with a VLD HW accelerator (TM-1100, TM-1300).

VdecMpeg



Description

The MPEG-1/2 video decoder library is capable of decoding all MPEG-1 video elementary streams and MPEG-2 streams with 4:2:0 sampling; 4:2:2 streams are not supported. Typically MPEG-2 main profile @ main level streams are supported. However, with higher clock frequencies, also HD streams could be decoded.

VdecMpeg accepts video elementary streams at its input side and outputs decoded YUV images, along with a structure required to render the images properly. This structure contains pixel aspect ratio information, as well as 3:2 pull down information. The second output can be used to stream out user data that is multiplexed into the elementary stream. This data could contain VBI information for example.

VdecMpeg assigns presentation time stamps to the outgoing YUV packets. These time stamps are derived from PTSs received at the input side.

Apart from the above mentioned standard decoding features, VdecMpeg supports 2 embedded resizing modes, one for half-resolution output and one for quarter-resolution output. When used in one of these modes, VdecMpeg performs the necessary scaling internally and saves memory for frame buffers as well as CPU cycles due to fewer pixels that need to be copied in the motion compensation process.

VdecMpeg also supports trick modes in which in supports only I-frames, or I- and P-frames.

Applications

- DVD Players
- Digital Video Recording Systems
- STB

Documentation

A detailed document describing the API and the internal behaviour of the component is available.

Features:

- decodes MPEG-1 and MPEG-2 video elementary streams at all resolutions and bitrates (CPU power permitting)
- optional embedded horizontal and vertical resizing to save frame buffer memory and CPU cycles
- output of user data on separate TSSA output pin
- generates proper presentation time stamps
- performs simple, optional error concealment
- suppports trick modes, i.e. decoding of I-frame only or I- and P-frames
- optional output for private data from sequence headers, GOP headers, and Picture headers
- support for still image decoding
- DVP compatible

www.semiconductors.philips.com

VdecMpeg

Technical Information

Memory Usage

Static Memory	199.8 KBytes
Dynamic Memory	151.1 KBytes

Note that additional memory is required for buffering of input and output data. Typically four frame buffers are required for the video output connection.

Performance

Decoding At Full Resolution

Stream	Bit Rate	Image Size	Average Load
cact_060.m2v	4 Mbps	704 x 704	98.95
susi_120_625.m2v	12 Mbps	704 x 704	146.37
tcela-10.bits	10 Mbps	720 x 540	197.81

Decoding With Embedded Resizing At Half Resolution

Stream	Bit Rate	Image Size	Average Load
cact_060.m2v	4 Mbps	704 x 704	76.98
susi_120_625.m2v	12 Mbps	704 x 704	115.72
tcela-10.bits	10 Mbps	720 x 540	149.41

Decoding With Embedded Resizing At Quarter Resolution

Stream	Bit Rate	Image Size	Average Load
cact_060.m2v	4 Mbps	704 x 704	76.08
susi_120_625.m2v	12 Mbps	704 x 704	121.08
tcela-10.bits	10 Mbps	720 x 540	143.46

Other Information

Supported Processors	TM-1100, TM-1300
Version	4.5
Patent/License Issues	Manufacturer of end product to pay license fees to MPEG consortium
Built with Compiler Version	V5.7.1 of tcs2.2-dvp0003WinNT

Related TriMedia TSSA Software Components

DemuxMpegPs, DemuxMpegTs, VrendVo, VencMpeg2

Example Programs

This library is shipped with multiple example programs:

- exolVdecMpeg can be used to play back MPEG video elementary streams from a file
- exolDemuxMpegPS can be used to play back MPEG program streams from a file

Release Date: August 2003