



## Digital Video Signal Processor

### OVERVIEW

The PANELTV™ MV is Trident's third generation DDTV single-chip mixed-signal video processor product. It integrates a high performance motion and edge adaptive de-interlacer with film mode recovery, scan rate and frequency conversion circuitries, and a graphical-based OSD for full support of today's premier LCD TV applications. Designed for maximum system design flexibility, PANELTV™ MV integrates all video interfaces to support hybrid digital and analog TV chassis applications. The PANELTV™ MV uses a 320-ball BGA package allowing multiple video data input and output configurations. PANELTV™ MV is ideal for applications in Digital TVs, Plasma TVs, LCD TVs, and Set-top boxes, where high precision video processing and scan rate frequency conversion are required. The users of Trident's single chip PanelTV™ video processor(s) will benefit from many features available while maintaining a price competitive advantage over the existing solution(s).

### FEATURES

- Integrated NTSC/PAL/SECAM video decoder
- Film mode recovery with bad edit detection
- Interlaced and progressive scan refresh
- 14 Dynamic picture quality enhancements (14D)
- VBI/Closed Caption and V-chip
- Graphical OSD capability

- 3rd gen. motion & edge adaptive de-interlacing
- 3rd gen. picture edge smoothing & sharpness control
- MPEG2 digital video interface (ITU-R BTU 656)
- SVGA digital/analog overlay with OSD and PIP
- Bi-linear image scaling graphics
- 16/20-bit LCD dithering
- PIP, POP, multi-picture, and panorama display modes
- Programmable zoom viewer with linear and non-linear scaling
- Analog and digital fast blank for Teletext
- DLTI-Gamma correction and alpha blending
- High-speed and low-cost SDRAM/SGRAM support
- High precision 10-bit ADC front end and 10-bit DAC
- Advanced dual channel digital noise reduction Y/C
- Maximum output support up to SXGA
- 24-bit simultaneous digital input and digital output
- Direct YPbPr output with 525P/625P copy protection
- 3.3 V and 2.5 V power supply
- Single chip: 320 BGA package

### INPUTS / OUTPUTS

- One Composite (CVBS) input
- One S-video input
- 8-bit video interface for external TV decoder input (CCIR/ITU-R 656 input)
- One 24-bit digital RGB input
- Selectable (shared input) SVGA/MPEG2 digital video input (CCIR/ITU-R BTU 656)
- YCrCb Component Input

- 8/16/20/24-Bit Digital RGB output
- One Analog RGB output
- Direct YPbPr output with 525P copy protection

### DESCRIPTIONS

#### Motion Adaptive Video Decoder

- NTSC, PAL, and SECAM format support
- High precision 10-bit ADC analog front-end
- Integrated VBI slicer for Closed Caption and V-chip
- Enhanced dual-channel, frame-recursive YC noise reduction

#### Motion & Edge Adaptive De-interlacing

- 3rd generation adaptive edge smoothing algorithm for enhancing image clarity and sharpness
- Advanced film mode recovery with fast response bad-edit detection
- Pixel-based motion and edge adaptive de-interlacing

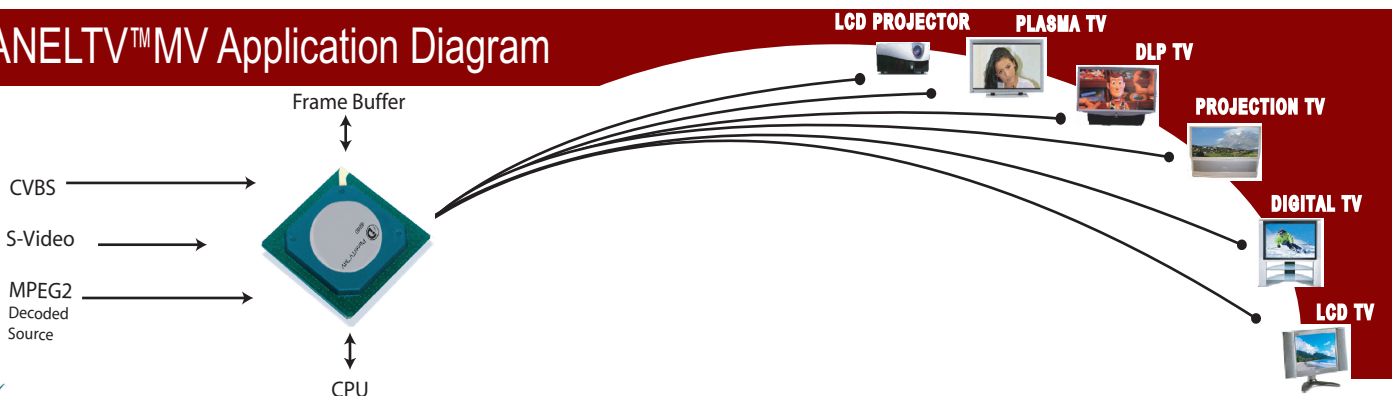
#### Interlaced and Progressive Scan Refresh

- Programmable blank time--control optimal for HDTV format converter application
- Interlaced @ 60Hz to 100 Hz
- Progressive scan @ 50 Hz to 75 Hz

#### 14D: Dynamic Picture Enhancements

- Dynamic luminance transience index
- Dynamic chrominance transience index
- Dynamic scan velocity modulation

## PANELTV™ MV Application Diagram





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- Dynamic digital comb filter
- Dynamic motion & edge adaptive de-interlacing
- Dynamic temporal frame-filtering noise reduction
- Dynamic gamma control
- Dynamic black level extender
- Dynamic brightness/contrast adjustment
- Dynamic adaptive smoothing filter
- Dynamic frame/scan rate converter
- Dynamic white peak level restriction
- Dynamic room temperature color correction
- Dynamic digital SVGA overlay

## Multi Screen Display Modes

- Picture-in-Picture (PIP). The PIP display mode is available with 16 different color frames for maximizing viewing experience. It can be repositioned to suit personal preferences and habits.
- Picture-Out-Picture (POP), multi-picture, cinema 1, and cinema 2 are some forms of dual program screening supported by the advanced architecture of the DPTV™. For multi-picture viewing, the screen is divided evenly into 4 or 9 smaller screens.
- Panorama viewing is best supported on a 16:9 aspect ratio

screen. It is also supported on a 4:3 aspect ratio screen by downsizing the picture to fit the screen width. Other forms of downsizing are also available.

## Advanced Picture Processing

- Advanced linear and non-linear panorama scaling algorithms are applied to maximize the viewing experience in the various display modes.
- The programmable zoom viewer allows partial still pictures and live broadcast to be viewed in greater detail. This feature uses the technology available in the PIP and OSD features of the PanelTV™MV.
- Alpha blending and overlay results in higher clarity and definition of objects of a picture while maintaining a more natural "look and feel" as it accounts for foreground and background colors.
- Picture controls such as hue, saturation, brightness, and contrast can be automatically adjusted to their optimal balance.
- Gamma correction.

## OSD and (optional) VBI / Closed Caption

- Vertical Blank Interval (VBI) is a new industry standard for transmitting non-video data over the TV broadcast signal

during the dead time (Vertical Blanking). Closed caption is also a non-video data that uses this portion of the transmission time.

- On-Screen Display (OSD). Colorful graphical-based OSD for advanced menu designs.

## Software

- TDAPI-complete C-based API to customize user interface for fast time to market

## Technical Support

- Evaluation Board
- Technical Reference Manual (TRM)
- Software Programmer's Guide (SPG)
- Application Notes
- White Papers

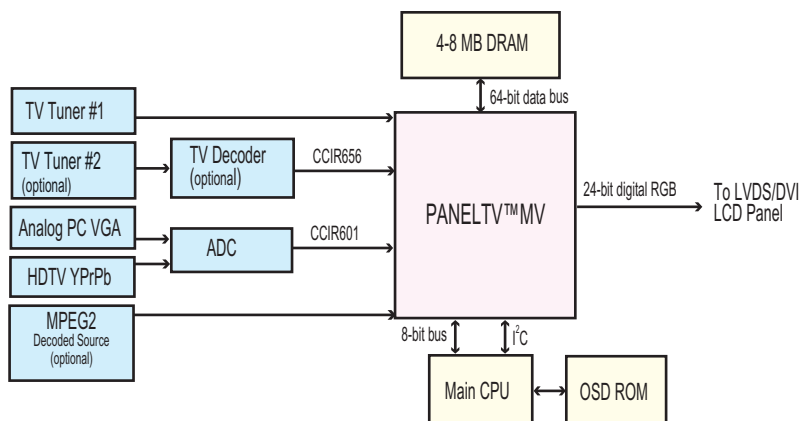
## Complete Evaluation Kit

- Production-ready reference board supports the TDAPI development kit

## Packaging

- 320-Pin BGA
- Ordering part number is 6860

## Trident PanelTV™MV Solution



- Enhanced video features such as POP, Cinema 1, Cinema 2, OSD, etc., are controlled through the Micro-Controller.
- Minimum frame buffer RAM is 4MB for normal 3D operations, panorama, de-interlacing, or other advanced features.



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