

## Single-chip dual-channel LCD TV controller

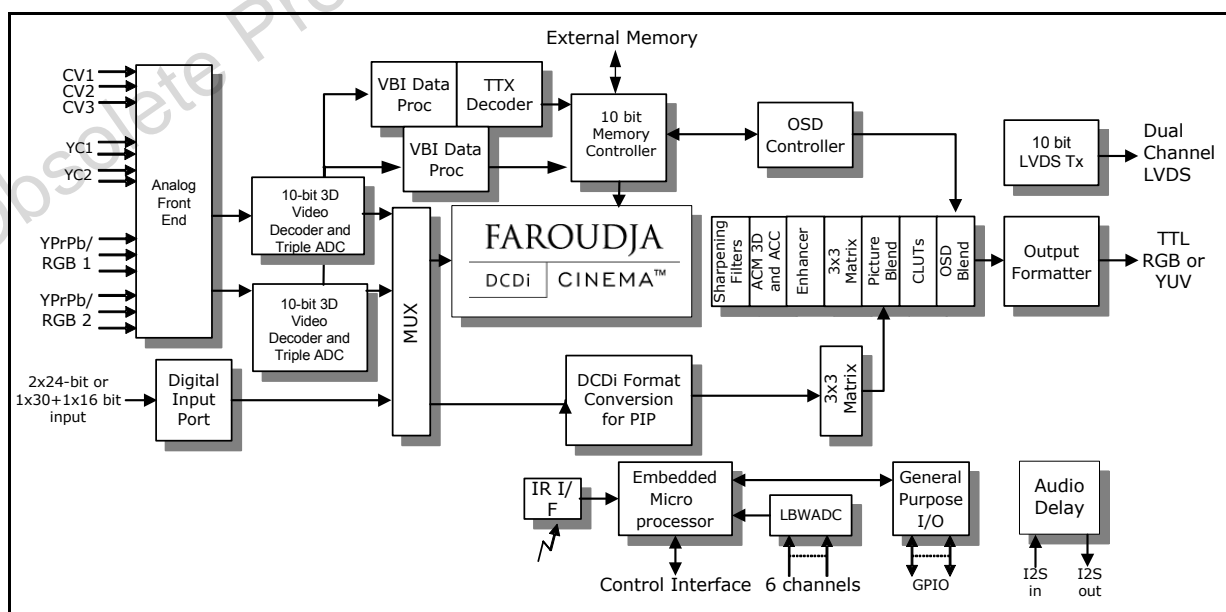
Data Brief

### Features

- True 10-bit processing
- Integrated 3D video decoder
- Second integrated 3D video decoder available
- Flexible digital capture up to 165 MHz and analog capture up to 162 MHz
- Next generation 10-bit Faroudja DCDi Cinema® format conversion
- VBI signal processing including WST version 2.5 support
- Flexible DDR memory interface with 10-bit video processing
- Faroudja® TrueLife™ video enhancer
- Advanced Picture-in-Picture (PIP) features
- 10-bit Advanced Color Management (ACM-3D) and Adaptive Contrast Control (ACC)
- On-chip microprocessor
- Advanced bitmapped OSD controller
- LCD overdrive
- Embedded 10-bit dual-channel LVDS for 1080p and WUXGA panel support
- Package: 416 PBGA

### Applications

- LCD and PDP TV
- DLP®, LCD, and LCOS front and rear projection



# 1 Description

The FLI30436 chip offers high integration for advanced, dual-channel applications of Picture-in-Picture (PIP) and Picture-by-Picture (PBP). Two video decoders with 3D comb filters and two channels of DCDi processing provide the highest quality picture for a two-channel application. In addition, the FLI30436 can power up to 1080p/WUXGA displays.

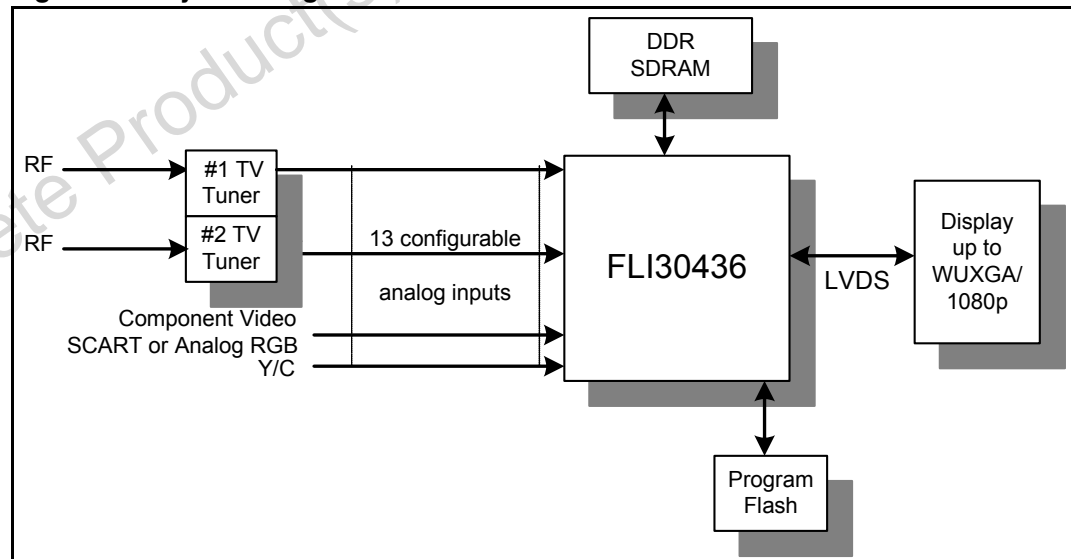
True 10-bit performance throughout the device, Advanced Color Management (ACM-3D), and DDR memory with picture data capacity of 10 bpp provide an exceptionally high level of video quality. This exclusive level of video quality technology previously seen on Faroudja Home Theater Systems is now available in a single-chip solution.

The FLI30436 also comprises an integrated Analog Front-End (AFE) that includes two Triple ADCs, an integrated cross-point switch, and two Faroudja Intellicomb™ 3D comb filters. The flexible AFE ensures simple PCB design with direct connections to TV tuners and input video connectors. In essence, the FLI30436 is the only device needed for a single LCD TV chassis supporting worldwide standards. For regional variations, only connector and firmware changes are required.

The integrated VBI dataslicer and decoder remove the need for external components resulting in significant cost reduction. The FLI30436 supports many worldwide VBI standards for applications of Teletext, Closed Captioning, V-Chip, and other VBI services.

An embedded microprocessor and a versatile OSD in a single device will facilitate rapid development of a reliable and attractive product. The FLI30436 utilizes the common Cortex family firmware for easy and effortless migration across different hardware platforms within this family.

**Figure 1. System diagram**



## 2 Feature attributes

- Flexible digital and analog capture
  - 13 configurable analog inputs
  - Direct connection from tuner or connector to analog input pin
  - Supports analog RGB/YUV capture up to 162 MHz and digital input capture up to 165 MHz
  - Full SCART support including RGB fast blank
  - 4:4:4/4:2:2/CCIR656/601 8/16/24/30-bit digital input port
  - Simple connection to JPEG and MPEG processors with a 8-bit bi-directional media port
- Integrated 3D video decoder
  - Faroudja IntelliComb technology
  - Two 3D adaptive comb filters for luma–chroma separation
  - Supports Composite, S-Video, and Component (including High Definition) video input signals
  - Supports all broadcast TV video standards—NTSC (North America and Japan), PAL (I, B, G, H, M, D, N), SECAM (D, K, L, B, G)
  - Supports playback video standards—NTSC443 and PAL-60
  - Macrovision™ and VCR trick mode support
- VBI signal processing
  - Multi-standard digital VBI dataslicer
  - WST FastText page support access with > 2048 page cache
  - Supports WST level 2.5
  - V-chip, VPS, Closed Captioning, XDS, CGMS, and WSS decoder
  - Supports VBI frame freeze
- Faroudja DCDI Cinema format conversion
  - Low angle de-interlacing processing
  - Per pixel Motion Adaptive De-interlacing (MADi) up to 1080i format
  - Format conversion up to WUXGA resolutions
  - Panoramic and anamorphic non-linear scaling
  - Adaptive media display processing for 3:2 and 2:2 video content
  - Special 3:3 and 2:2 film mode for improved film processing
  - Adaptive 3D/TNR noise reduction
  - Media noise reduction for MPEG inputs
- On-chip microprocessor
  - Integrated x186-based microprocessor with rich function library
  - General Purpose Inputs/Outputs (GPIOs) available for managing system devices (keypad, backlight, NVRAM, etc.)
  - Advanced power control for low power stand-by mode
  - 2-wire serial master bus interface for external device control

- Faroudja TrueLife video enhancer
  - High performance and programmable sharpening filters with noise coring
  - Programmable main channel horizontal and vertical filter coefficients
  - Non-linear chroma and luma enhancement
  - Removal of the DVD Chroma Upsampling Error (CUE) introduced by some DVD sources
- Advanced Color Management (ACM-3D)
  - ACM-3D allows flexible flesh-tone compensation, blue stretch, and other image enhancements
  - ACM-3D provides flexible programming, polar coordinate representation, and six-axis color control
  - ACC ensures full dynamic range is used in video content
- Picture-in-Picture (PIP)
  - Programmable PIP channel horizontal and vertical filter coefficients
  - Supports high performance programmable sharpening filters with noise coring
  - Video PIP over full screen graphics and video backgrounds
  - Supports graphics and video PIP (CVBS/S-Video/Component ED/HD) over full screen video background (CVBS/S-Video)
  - Side-by-side window support
  - DCDi Edge® processing for second channel window
- Output formats
  - Dual-channel 48-bit TTL output or single-channel 30-bit TTL output
  - Dual-channel 10-bit LVDS transmitters for direct connection to LCD modules
  - 24-bit 4:2:2 YUV TTL output – 12 bpc
  - 120 Hz WXGA panel support using FRC and Black Frame Insertion (BFI) technique
- Other features
  - Integrated infrared decoder
  - Integrated low bandwidth ADC with 6 input channels
  - 4 integrated PWM outputs for LCD backlight control
  - Integrated I2S audio delay to exact audio and video synchronization
  - Supports DDR1-500 and 512 Mb
  - Reduces LCD video smearing artifacts
  - Advanced bitmapped OSD controller

### 3 Ordering information

**Table 1. Order codes**

| Part number | Description   |
|-------------|---------------|
| FLI30436-AC | 416-ball PBGA |

In order to meet environmental requirements, ST offers this device in ECOPACK® packages. These packages have a lead-free second level interconnect. The category of second level interconnect is marked on the package and on the inner box label, in compliance with JEDEC Standard JESD97. The maximum ratings related to soldering conditions are also marked on the inner box label. ECOPACK is an ST trademark. ECOPACK specifications are available at [www.st.com](http://www.st.com).

Obsolete Product(s) - Obsolete Product(s)

## 4 Revision history

Table 2. Document revision history

| Date        | Revision | Changes          |
|-------------|----------|------------------|
| 03-Nov-2008 | 1        | Initial release. |

Obsolete Product(s) - Obsolete Product(s)

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