

## Entry level LCD TV controller with HDMI

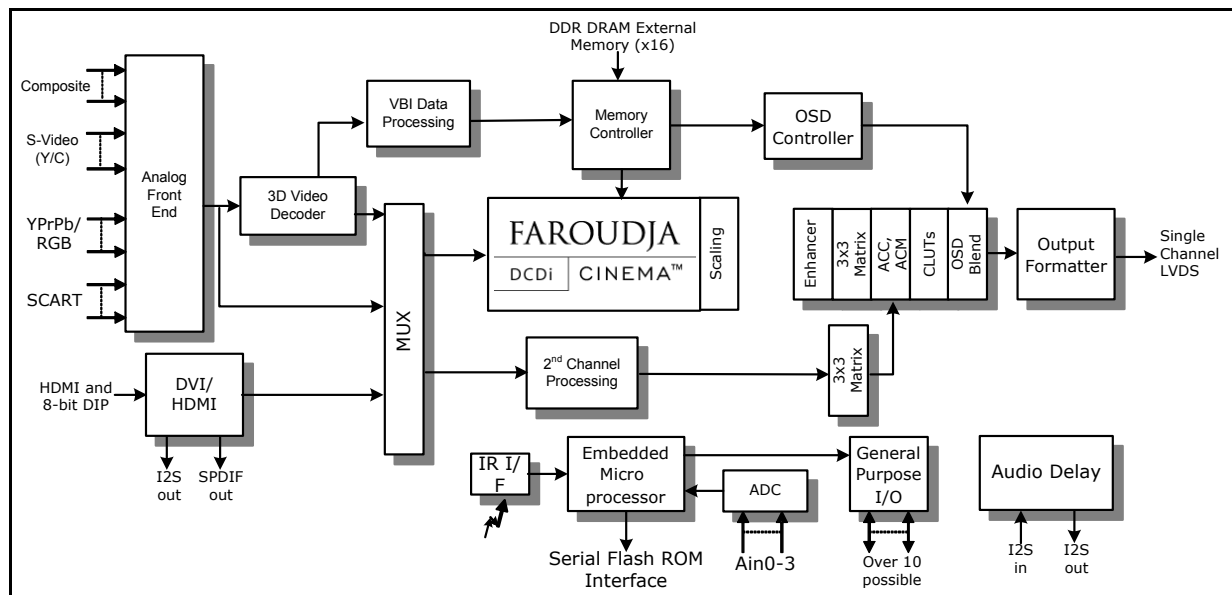
Data Brief

### Features

- Integrated 3D video decoder
- Integrated HDMI input
- PIP applications
- 1080i MADi superior video quality
- Flexible analog capture up to 1080p YPrPb or 135 MHz RGB
- VBI signal processing including WST version 2.5 support
- Flexible DDR memory interface
- Faroudja® TrueLife™ video enhancer
- Advanced Color Management (ACM-3D) and Adaptive Contrast Control (ACC)
- On-chip microprocessor
- Bitmapped OSD controller
- Package: 208 PQFP

### Applications

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



# 1 Description

The FLI8541H offers high integration in an entry level product with HDMI input, an integrated video decoder with a 3D comb filter, and proven DCDi Cinema technology.

The Faroudja DCDi Cinema video format converter and the Advanced Color Management (ACM-3D) provide exceptional video quality. The video quality level that was exclusive to Faroudja Home Theater Systems is now available in a single-chip solution.

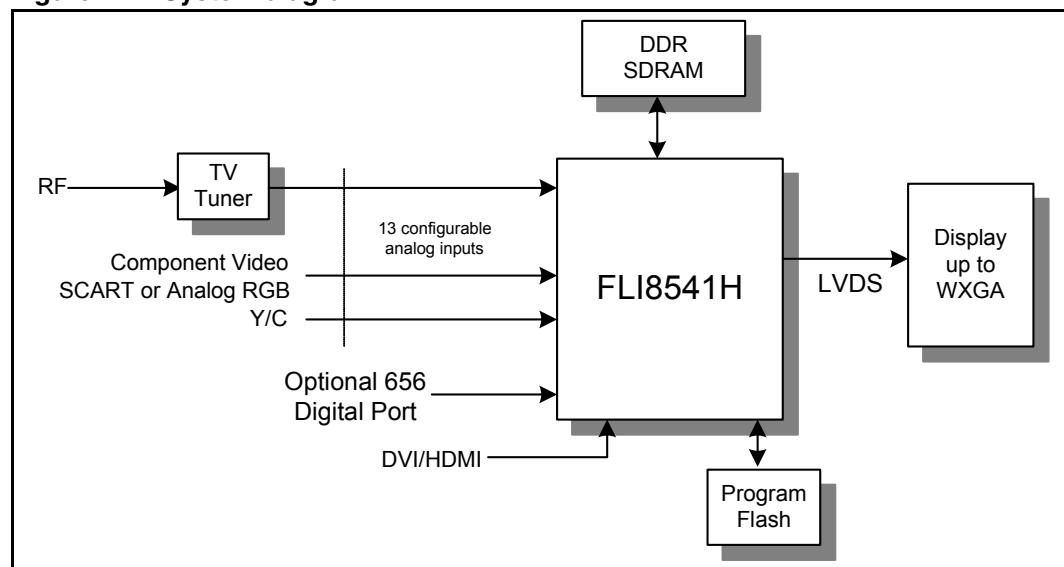
The FLI8541H also comprises an integrated Analog Front-End (AFE) with triple ADCs and a cross-point switch. The flexible AFE ensures simple PCB design with direct connections to TV tuners and input video connectors. Thus, the FLI8541H, for a single LCD TV chassis, is able to support worldwide standards. The only requirements for the regional variations are connectors and firmware changes.

The integrated VBI dataslicer and decoder eliminate the need for external components resulting in significant cost reduction. The FLI8541H supports many worldwide VBI standards for applications of Teletext, Closed Captioning, V-Chip, and other VBI services.

The FLI8541H can also be used as part of a digital TV solution with the proven Faroudja DCDi Cinema video performance.

An embedded microprocessor and a versatile OSD in a single device will facilitate rapid development of a reliable and attractive product. The FLI8541H 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 pins
  - Integrated anti-aliasing filter
  - RGB capture up to 135 MHz
  - Full SCART support including RGB fast blank
  - 1080p analog capture for YPrPb
  - Support for triple 10-bit ADCs for better SNR
  - Integrated HDMI input with HDCP support
  - Integrated DVI 1.0 input supported
- Integrated 3D video decoder
  - Faroudja IntelliComb™ technology
  - 3D adaptive comb filter for luma–chroma separation
  - Supports Composite, S-Video, and Component (including High Definition) video input signals
  - Supports all analog TV broadcast video standards—NTSC (North America and Japan), PAL (I, B, G, H, M, D, N), SECAM (D, K, L, B, G)
  - Macrovision® and VCR trick mode support
- VBI signal processing
  - Multi-standard digital VBI dataslicer
  - WST Teletext FastText page support access
  - Supports WST level 2.5
  - V-chip, VPS, Closed Captioning, XDS, CGMS, and WSS decode
- Faroudja DCDI Cinema format conversion
  - Low angle de-interlacing processing
  - Per pixel Motion Adaptive De-interlacing (MADi) up to 1080i format
  - Panoramic and anamorphic non-linear scaling
  - Adaptive media display processing for 3:2 and 2:2 film content
  - Adaptive 3D 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
  - SPI or LPC Flash supported for code storage
- Advanced bitmapped OSD controller
  - 16 true color bitmap tiles with 1, 2, 4, and 8 bits per pixel
  - Horizontal and vertical stretch of OSD menus

- Blinking, transparency, and blending
- Faroudja Truelife video enhancer
  - High performance and programmable sharpening filters
  - Non-linear chroma and luma enhancement
  - Removal of the DVD Chroma Upsampling Error (CUE)
- 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)
  - Dynamic scaling for advanced PIP transitions
  - Video PIP over full screen graphics and video backgrounds
  - Graphics over full screen video background
  - Side-by-side window support
  - PIP zoom support
  - Multi-PIP
- Output formats
  - Single-channel 10-bit LVDS transmitters for direct connection to LCD modules
  - Up to WXGA resolution output
- Other features
  - Integrated infrared decoder
  - Integrated low bandwidth ADC with 4 input channels
  - 3 integrated PWM outputs for LCD backlight control
  - Integrated I2S audio delay to exact audio and video synchronization
  - I2S output for HDMI input audio with HDMI audio delay
  - DDR1 1x16 memory
  - Memory size is flexible up to 256 Mb

### 3 Ordering information

**Table 1. Order codes**

| Part number    | Description |
|----------------|-------------|
| FLI8541H-LF-BE | 208 PQFP    |

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).

## 4 Revision history

**Table 2. Document revision history**

| Date        | Revision | Changes          |
|-------------|----------|------------------|
| 05-Sep-2008 | 1        | Initial release. |

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