

CVBS Video Encoder for SD/HD video input with frame rate conversion

MDIN-165



- ◆ **MDIN-165** is a highly integrated single chip for converting any video input to CVBS video output with format conversion, anti-aliasing filter, anti-flickering filter and video enhancement.
- ◆ **MDIN-165** converts any video input to CVBS video output including non-standard video input.
- ◆ **MDIN-165** provides two digital input ports. It performs format conversion and frame rate conversion to produce CVBS video output with excellent signal quality preservation.
- ◆ **MDIN-165's** format converting and video enhancement capability are suitable for digital display applications such as camera sensor application, digital video recorder(DVR) and other video systems.

*The Macro Image Technology's proprietary iMARV technology makes **MDIN-165** the highest quality video encoder.*

Main Features

- ◆ Two digital video input ports for 8-bit precision any interlaced or progressive video with supporting non-standard input
- ◆ Video Encoder(NTSC/PAL) for any video input to CVBS output
- ◆ Horizontal anti-aliasing filter for high resolution video input
- ◆ Frame rate conversion for any video input with embedded frame buffer memory
- ◆ User programmable anti-flickering filter
- ◆ Independent horizontal and vertical scaling
- ◆ 3D noise reduction(3D NR) filter with cross-color suppression(CCS) for interlaced video input
- ◆ Horizontal peaking filter and color enhancement processing for crisper picture quality
- ◆ Programmable brightness, contrast, hue, saturation control with adaptive contrast enhancement
- ◆ 1 layer OSD with 16 colors and 4 sprites(bitmap and character mode)
- ◆ Cost and size effective embedded frame buffer memory
- ◆ Serial I²C bus interface
- ◆ 100-pin FBGA packages(8mm x 8mm)

Specifications

Video Input

Digital video input with 8-bit precision
 Video format : RGB/YCbCr 4:4:4 or YCbCr 4:2:2
 Y/C type : Multiplexed(BT.656) or separated(BT.601)
 Sync type : Separated or embedded(BT.656/BT.1120)
 Digital input : 24-bit(4:4:4) or 8/10/16/20-bit(4:2:2)
 Supports non-standard video
 Maximum horizontal size : 1920
 Maximum vertical size : 1024(progressive), 1080(interlaced)
 Maximum pixel rate : 135 MHz

Video Output

CVBS or Y/C(S-Video) supports NTSC and PAL

3D Noise Reduction and Cross Color Suppression

High quality 3-D noise reduction with motion detection for interlaced video inputs
 Cross-color suppression for 2-D comb-filtered input

Format Conversion

Independent horizontal and vertical scaling with anti-aliasing interpolation filter
 Format conversion from one format to another format with an arbitrary scaling ratio
 Scaling ratio : x1/15 ~ unlimited
 Programmable size & position zoom in/out

Frame Rate Conversion

Input video frame rate range from 3Hz to 250Hz
 Utilizes embedded memory as frame buffer

Signal Enhancement

High order programmable horizontal peaking filter
 Filter for color component enhancement
 LTI and CTI for edge enhancement
 Programmable gain control & coring
 Adaptive contrast enhancement
 Dithering down to 5 bits

Display Functions

Brightness, contrast, hue, saturation control
 Programmable display size and position
 Horizontal and vertical mirroring

OSD

Bitmap and character mode OSD
 One layer with 4 sprites
 16-color with 32-level alpha blending
 Up to 32x63 font size, and 1-bpp or 4-bpp font color
 32-row x 16-col or 16-row x 32-col character map
 Bitmap copy and run-length decoding

Frame Buffer Memory

Embedded frame buffer memory

Communication Interface

2-wire serial interface-I²C

Miscellaneous

Auto detection of input video/sync
 Support composite sync and non-standard sync signal
 Lock-to-input sync mode or free-run mode
 Programmable output sync signal generation
 Built-in test pattern generation logic

Electrical and Mechanical Characteristics

1.2V & 3.3V supply voltage
 3.3V I/O signal interface
 Power consumption : Under 0.45Watt
 100-pin FBGA package(8mm x 8mm/0.75mm pitch)