i-Chips

IMAGE PROCESSORS

IP00C241

Memory Less Scaler LSI for 4K60Hz

Product Description

The IP00C241 is a 4K60Hz scaler LSI supporting frame-memory-less scaling up/down, high-speed serial interfaces for V-by-One®HS/LVDS Tx, and V-by-One®HS/LVDS Rx, and serial flash interfaces for configuring OSD display.

Scaling up/down with 333MHz processing is available. Additionally, it is possible to configure the OSD screen by transferring from a serial flash. The high image processing quality is achievable with 4K60Hz images by using this device.

It complies with both PQ and HLG standards for the "HDR" standard and can be used to develop cutting-edge high-quality products.

Features

Input/Output (4K60Hz x3)
- 30-bit RGB/YUV4:4:4/ YUV4:2:0, 20-bit YUV4:2:2
  @V-by-One®HS 4Gbps, 8-lane 2-port
  @LVDS 160MHz x 4,   FPD-Link, 1-port
- Up to 4K60Hz input/output (Any path can be selected from 3-input/output)

Input/Output Image size
- Horizontal synchronization signal interval: 16,384 pixels
- Effective horizontal image area: 2,176 pixels

Frame lock
- Genlock supported

Scaler
- Zoom/shrink: 6-symbol LUT, Coefficient ROM (64-set)
- 333Mpix/sec 2ch, support 4K60Hz single image processing

Image Quality Control
- Color management (Full Color Gamma)
- 3DLUT (17x17x17)
- Uniformity correction (by region and per-pixel)
- Bias/Gain/Gamma
- Edge enhancer (Spatial Filter)
- Dithering (12 → 10, 10 → 8)

Image Correction
- Flip function

xvYCC/Bt-2020
Fully supported

HDR
- SMPTE ST2084(PQ HDR10) and HLG methods supported
  (RGB 10-bit each)

CPU I/F
4-wire SPI

Bit map OSD
- Three types of graphics can be displayed at the same time: Font (2 colors), Graphic (256 colors) and Background OSD (up to 64k colors)
- Semi-transparent (up to 4 colors)
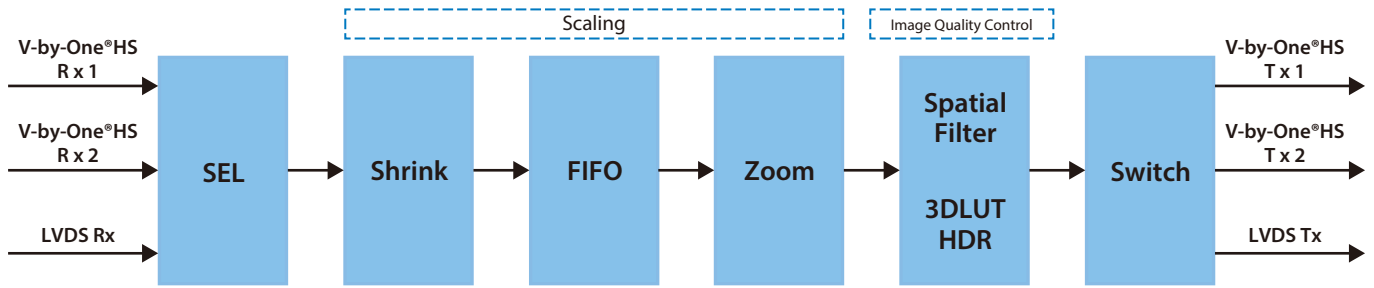- Scaling up for Background OSD (any size, 2-symbol)

Power supply
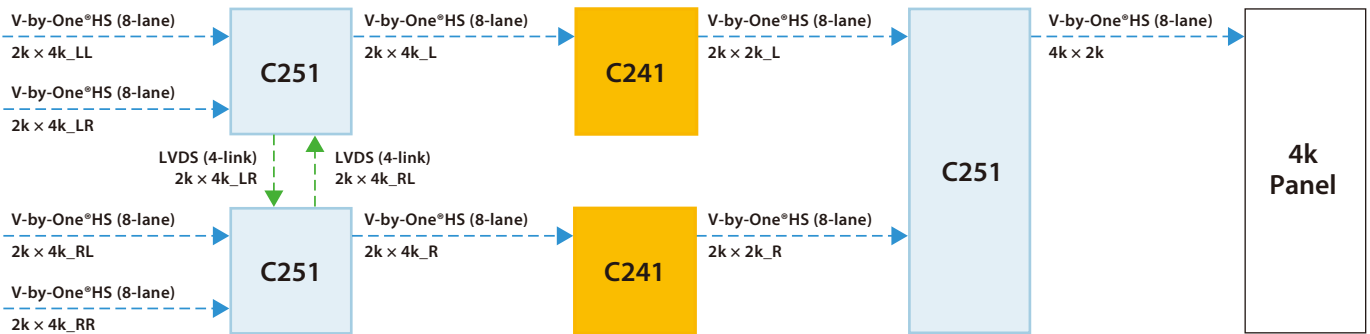3.3V/2.5V/1.1V

Package
385-pin, BGA (0.8mm pitch), 19mmx19mm

IP00C241 Memory Less Scaler LSI for 4K60Hz
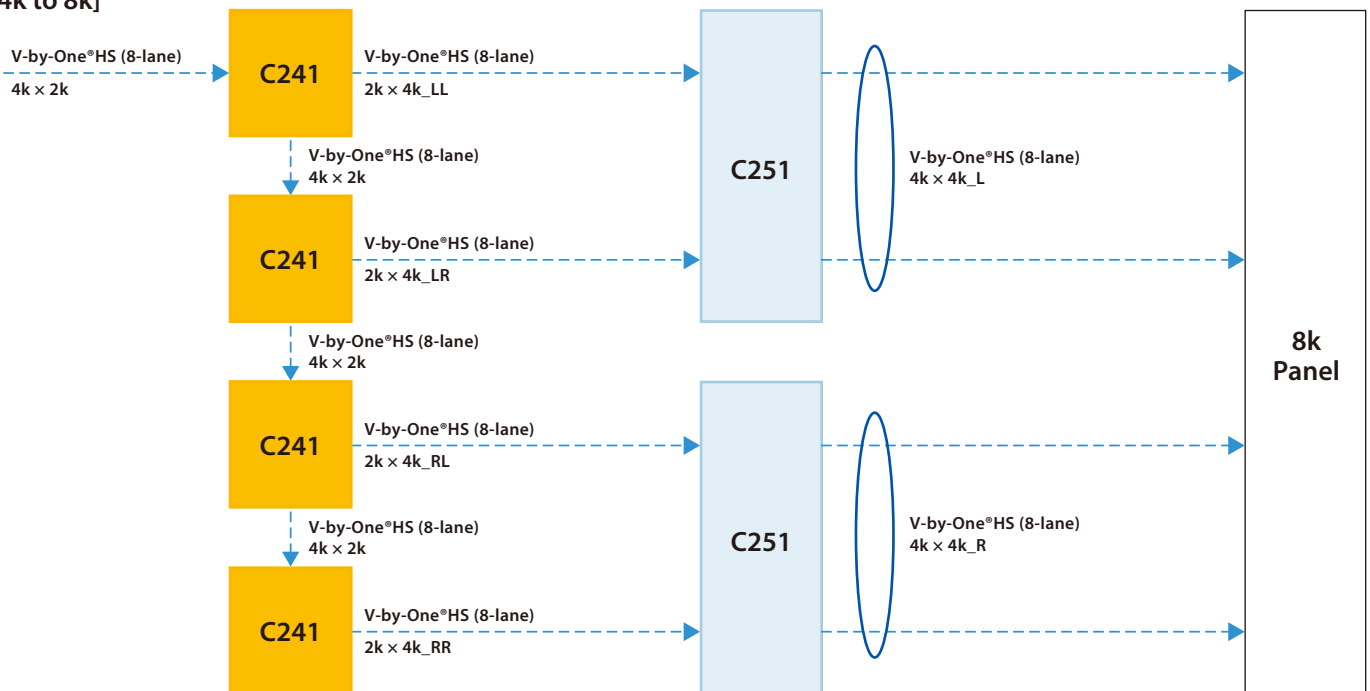
Block Diagram

Scaling

Image Quality Control

V-by-One®HS R x 1 → SEL → Shrink → FIFO → Zoom → Spatial Filter / 3DLUT HDR → Switch → V-by-One®HS T x 1

V-by-One®HS R x 2 →

LVDS Rx →

→ V-by-One®HS T x 2

→ LVDS Tx

Application Samples

[8k to 4k]

V-by-One®HS (8-lane) 2k × 4k_LL → C251 → V-by-One®HS (8-lane) 2k × 4k_L → C241 → V-by-One®HS (8-lane) 2k × 2k_L → C251 → V-by-One®HS (8-lane) 4k × 2k → 4k Panel

V-by-One®HS (8-lane) 2k × 4k_LR →

LVDS (4-link) 2k × 4k_LR / LVDS (4-link) 2k × 4k_RL

V-by-One®HS (8-lane) 2k × 4k_RL → C251 → V-by-One®HS (8-lane) 2k × 4k_R → C241 → V-by-One®HS (8-lane) 2k × 2k_R

V-by-One®HS (8-lane) 2k × 4k_RR →

[4k to 8k]

V-by-One®HS (8-lane) 4k × 2k → C241 → V-by-One®HS (8-lane) 2k × 4k_LL → C251 → V-by-One®HS (8-lane) 4k × 4k_L → 8k Panel

V-by-One®HS (8-lane) 4k × 2k → C241 → V-by-One®HS (8-lane) 2k × 4k_LR →

V-by-One®HS (8-lane) 4k × 2k → C241 → V-by-One®HS (8-lane) 2k × 4k_RL → C251 → V-by-One®HS (8-lane) 4k × 4k_R

V-by-One®HS (8-lane) 4k × 2k → C241 → V-by-One®HS (8-lane) 2k × 4k_RR →

※ "V-by-One®HS" is trademark of THine Electronics, Inc.

For more information please visit: **www.i-chips.co.jp**

i-Chips Technology, Inc.