Product Description

The IP00C381 is an all-in-one warping and edge-blending solution with a maximum 1,333Mpixel/sec signal processing capability. Thanks to 4K (up to 4096x2400) 60Hz input and output capability, 4K120Hz image processing and additional formats such as WQXGA (2560x1600) 120Hz are supported. It features an embedded warp table generator that implements real-time image processing for H and V keystone correction and pin-cushion correction. Edge-blending for white peaking and per pixel correction of edge-blending, results in higher performance image quality and products. Any angle rotation is available with 4K60Hz input/ output and therefore the device can be used in a wide range of applications.

Features

Input

- RGB 30bit/YUV4:4:4 30bit/ YUV4:2:0 30bit/YUV4:2:2 20bit/YUV4:2:2 10bit(BT656)
  @V-by-One®HS 4Gbps, 8-lane 2-port
  @LV-CMOS 166MHz supporting dual (EVEN/ODD) and DDR inputs 4-port
- 4K60Hz dual input
- 4K120Hz input supported

Output

- RGB 30bit/YUV4:4:4 30bit/ YUV4:2:2 20bit/YUV4:2:2 10bit(BT656)
  @V-by-One®HS 4Gbps, 8-lane 2-port
- 4K60Hz dual output
- 4K120Hz output supported

Input & Output Image Size

- Horizontal sync signal 16,384 pixels (max) @1ch
- Horizontal image active area 2,064 pixels (max) @1ch

External Memory

DDR3-SDRAM 64bit PC1600 (4G/2G/1G x16) x4

Serial Flash Interface
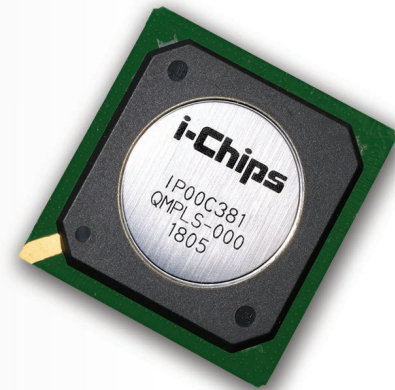
2G-bit x1 (max)

External/Internal Sync

- Output sync is compatible only with internal signal

Input/Output Sync/Asynchronous Behavior

- Frame rate conversion only when the output pixel clock is no smaller than input pixel clock.
- Tearing protection
- External force synchronization
- Genlock

Distortion Correction Mode

- RGB common distortion correction mode

Distortion Correction Method

- Coordinate correction look up table
- Embedded warp table generator (keystone correction and pin cushion correction)
- Load from external CPU or external serial flash

Distortion Correction Amount

- Up to 45 degrees (horizontal/vertical)
- Any angle rotation (combination with 90 degrees when 4K60Hz input/ output.)
- Any angle rotation (4K60Hz x1)
- Vertical shrink ratio is about x0.3 in case of 4K60Hz input/ output(this ratio is about x0.7 when 4K120Hz input/ output)

Image Correction

- Edge-blending (white peaking supported, by region and per pixel correction)
- Uniformity correction (by region and per pixel correction)
- Mirror/flip image
- 90 degree rotation

Image Quality Control

- 16-bit color gamma correction tables (7LUT available)
- Error diffusion, brightness and contrast adjustment

Bit Map OSD

- 256 colors/High color OSD (64K colors)
- Embedded font engine（65536 words）
- Blinking and semi-transparent (4 colors OSD)
- 90-degree rotation, OSD scroll
- Serial flash to bitmap

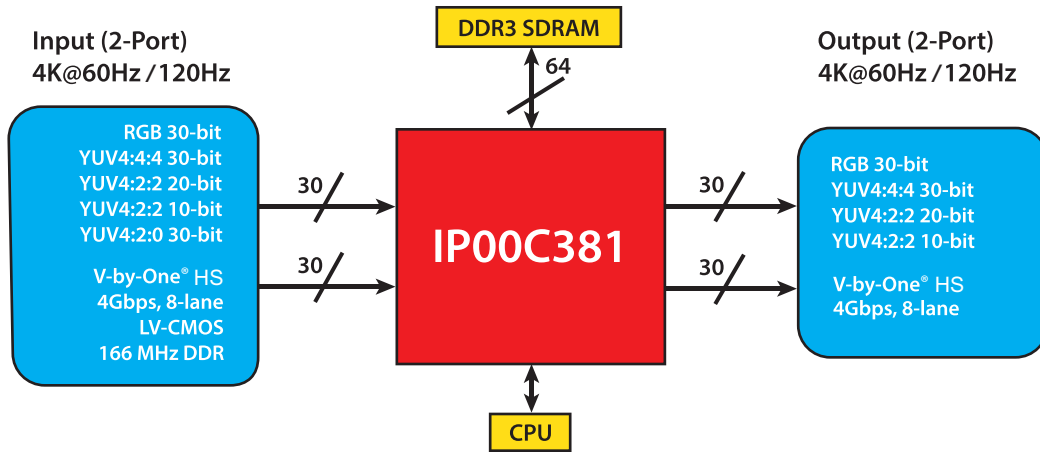### CPU Interface

8-bit parallel/4-wire serial
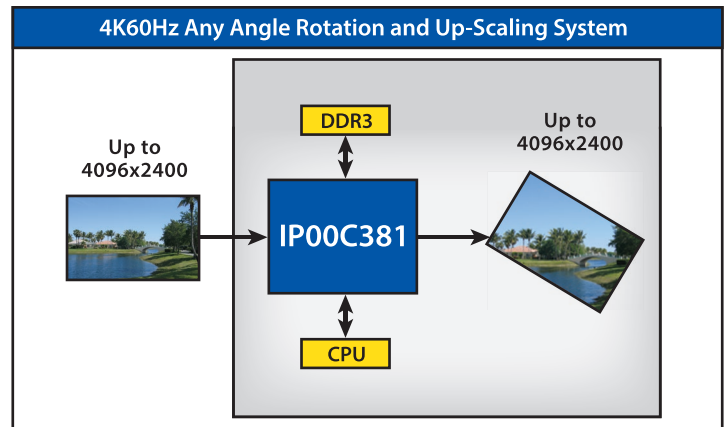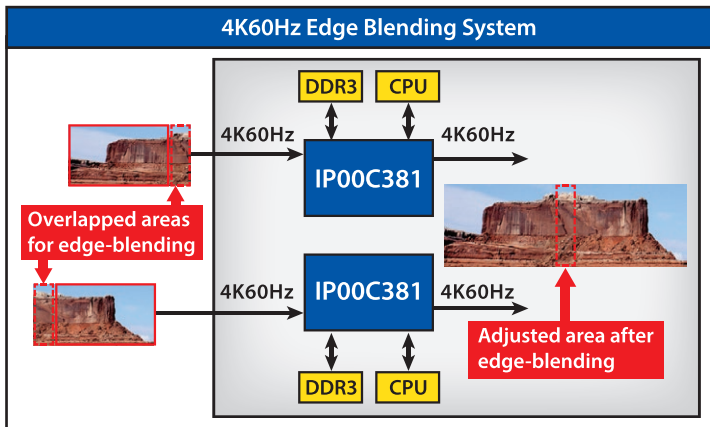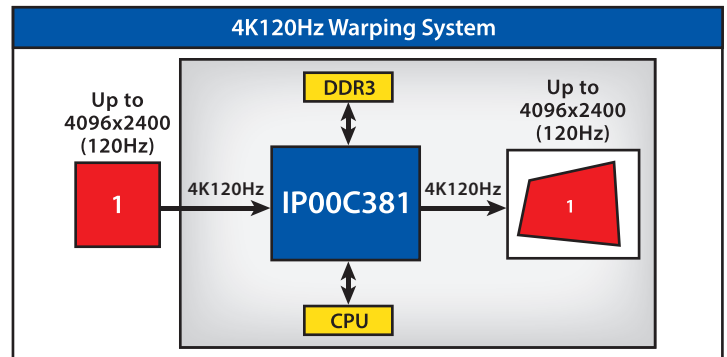
Power Supply

3.3V/1.5V/1.1V

Package

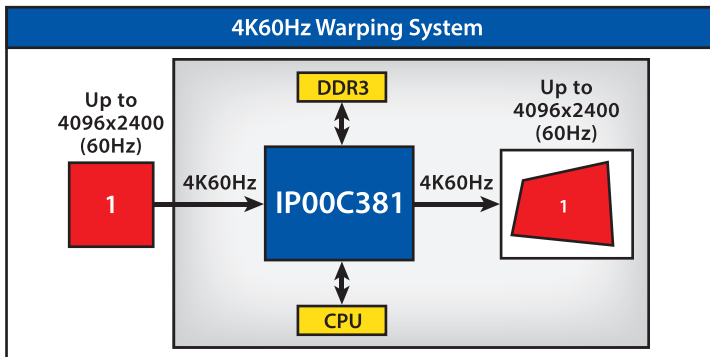684-pin BGA (0.8mm pitch), 27mm x 27mm

IP00C381 4K60Hz /120Hz Supported Warping/Edge-blending LSI

IP00C381 Block Diagram

DDR3 SDRAM

Input (2-Port)
4K@60Hz /120Hz

Output (2-Port)
4K@60Hz /120Hz

64

RGB 30-bit
YUV4:4:4 30-bit
YUV4:2:2 20-bit
YUV4:2:2 10-bit
YUV4:2:0 30-bit

V-by-One® HS
4Gbps, 8-lane
LV-CMOS
166 MHz DDR

30

30

IP00C381

30

30

RGB 30-bit
YUV4:4:4 30-bit
YUV4:2:2 20-bit
YUV4:2:2 10-bit

V-by-One® HS
4Gbps, 8-lane

CPU

Application Diagrams

4K60Hz Warping System

Up to
4096x2400
(60Hz)

DDR3

Up to
4096x2400
(60Hz)

1

4K60Hz

IP00C381

4K60Hz

1

CPU

4K120Hz Warping System

Up to
4096x2400
(120Hz)

DDR3

Up to
4096x2400
(120Hz)

1

4K120Hz

IP00C381

4K120Hz

1

CPU

4K60Hz Edge Blending System

DDR3   CPU

4K60Hz

4K60Hz

IP00C381

Overlapped areas
for edge-blending

4K60Hz

IP00C381

4K60Hz

Adjusted area after
edge-blending

DDR3   CPU

4K60Hz Any Angle Rotation and Up-Scaling System

Up to
4096x2400

DDR3

Up to
4096x2400

IP00C381

CPU

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

i-Chips Technology, Inc.