i-Chips

IMAGE PROCESSORS

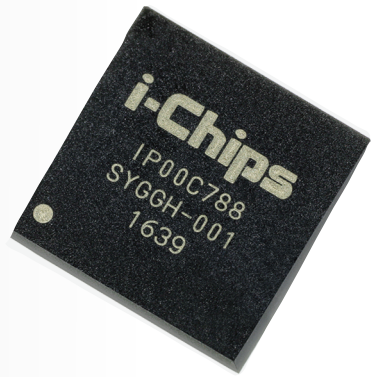
PRODUCT BRIEF

IP00C788

2K Warping/Edge-blending LSI

Product Description

The IP00C788 is an affordable, but refined warping and edge-blending chip supporting resolutions up to 2K (2048x1200). Its embedded warp table generator can support pin-cushion correction as well as keystone correction which results in higher speed processing for relatively simple image geometry corrections. Edge-blending for white peaking is supported, resulting in higher picture quality products. Thanks to the included de-interlacing function, this device can cover wider applications such as the input system from cameras etc. It also can be used as a single input and output scaler. Moreover the smaller package of the IP00C788 as compared to conventional devices enables the creation of a wider range of products and designs.



Features

Input (1-port)

30-bit RGB/YUV4:4:4, 20-bit YUV4:2:2, 10-bit YUV4:2:2 (BT656) @166MHz LV-CMOS, 166MHz High speed LVDS, 83MHz x2 LVDS (LV-CMOS is only available as either input or output.)

Output (1-port)

30-bit RGB/YUV4:4:4, 20-bit YUV4:2:2, 10-bit YUV4:2:2 (BT656) @166MHz LV-CMOS, 166MHz High speed LVDS, 83MHz x2 LVDS (LV-CMOS is only available as either input or output.)

Image Size

Horizontal sync signal 16384 pixels (max), image active area 2048x1200 (max)

External/Internal Sync

Output sync signal is compatible only with internal signal

External Memory

DDR3-SDRAM 16bit PC1600 (4G/2G/1G bit x 16) x 1

Serial Flash Interface

2G-bit x1 (max)

Distortion Correction Mode

RGB common distortion correction mode

Distortion Correction Method

- Coordinate correction look up table (grid 32x32, 16x16<default>, 8x8, 4x4, 2x2, 1x1<only 1x1 mode supporting horizontal up to 1280 in resolution>)
- Embedded warp table generator (keystone correction and pin cushion correction)
- Load from external CPU or external serial flash memory

Distortion Correction Amount

- Up to 45 degrees (horizontal/vertical)
- Any angle rotation (up to 45˚ rotation + 90˚ rotation)
- Vertical shrink ratio is about x 0.3
- Mirror/flip image, 90 degrees rotation

Image Correction

- Edge-blending (white peaking supported, by region and per pixel correction)
- Uniformity correction (by region and per pixel correction)

Image Quality Control

- 16-bit color gamma correction tables (3LUT available)
- Error diffusion, brightness and contrast adjustment

Interpolation Filter (Scaler)

- Horizontal/vertical 6-symbol programmable FIR filter (10bit/pixel)

De-interlacer

- Motion adaptive filter based on Y, YUV 4:2:2
- All major cadences supported

Bit Map OSD

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

CPU Interface

4-wire serial

Power Supply

3.3V/2.5V/1.5V/1.0V

Package

289-pin BGA (0.8mm pitch), 14mm x 14mm

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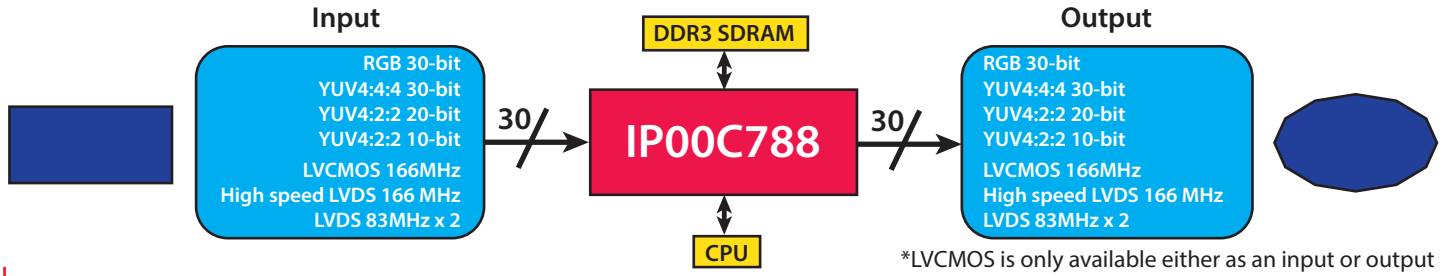
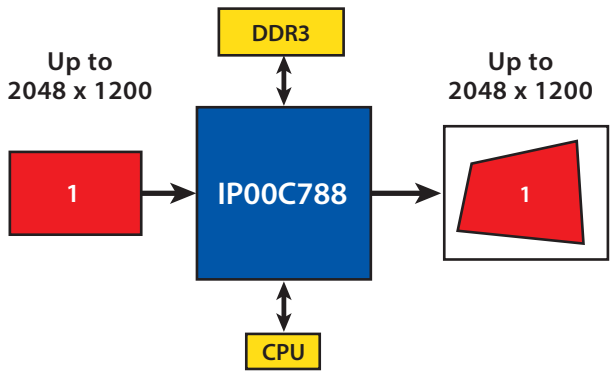
IP00C788 Block Diagram



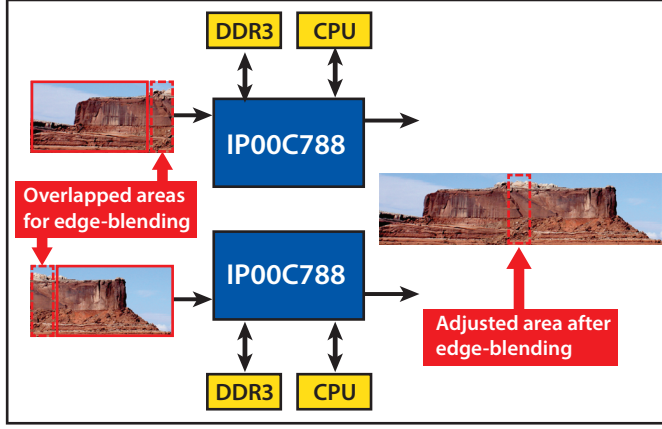
*LVCMOS is only available either as an input or output

Application Diagrams

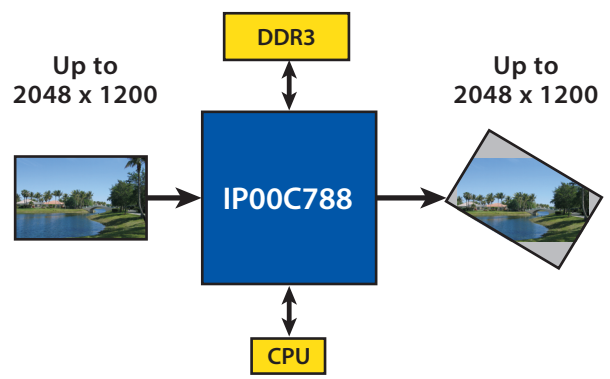
Warping System



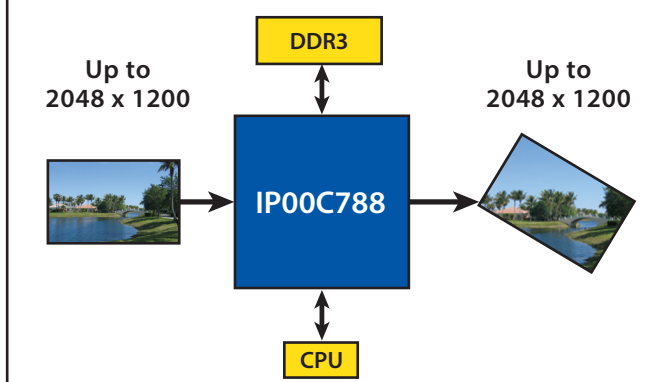
Edge-blending System



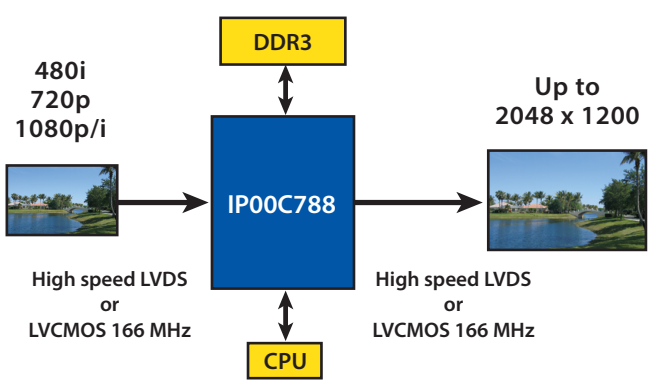
Any Angle Rotation System



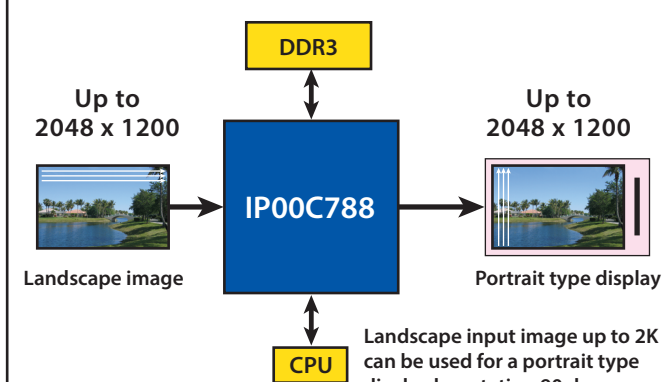
Any Angle Rotation and Up-scaling System



Single Input and Output Scaler System



Input Image 90 Degree Rotation System



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