

## Multi Camera Interface ICs

### ■ DESCRIPTIONS

The S2D13P04 is a camera interface IC designed for automotive multiple camera systems. The S2D13P04 integrates four-channel NTSC/PAL video decoders, which allow to connect four analog cameras simultaneously, and synchronously output the image data asynchronously input from the four cameras by using internal VRAM. The S2D13P04 also has image processing functions such as image composition of the four camera image data, distortion correction, and interlaced-to-progressive scan conversion. The S2D13P04 has a large-capacity VRAM built in, so it does not require an external memory.

### ■ FEATURES

- Video Input
  - Analog Video (CVBS) Input – 4 inputs
  - PAL/NTSC Decoder – 4 channels
  - NTSC-M, NTSC-J support
  - PAL-M, PAL-B, PAL-G, PAL-I, PAL-N support
- Video Output
  - Digital Output 8-bit YUV422 (with HSYNC/VSYNC) ITU-R BT.656 \*1
  - Interlaced Output \*2, 3
  - Progressive Output
- Video Output Mode
  - Fixed Mode
  - Auto Scan Mode \*4
  - Merge Mode \*2
  - Compression Mode \*2, 4
- Image Processing
  - Image scaling function
  - Interlaced-to-Progressive Conversion
  - Distortion correction function \*3, 4
- Output at stable frame rates
  - 720x480i 30fps (NTSC interlaced output)
  - 640x480p 30fps (NTSC progressive output)
  - 640x480p 30fps (NTSC with distortion correction enabled)
  - 720x576i 25fps (PAL interlaced output)
  - 768x576p 25fps (PAL progressive output)
  - 640x480p 25fps (PAL with distortion correction enabled)
- Host Interface
  - I2C Interface (Slave)
  - SPI Interface (Slave)
- No external RAM required
- Operating Temperature -40 to +85 °C (Ta)
- Operating Voltages Analog: 3.3±0.3V, IO: 3.3±0.3V  
Core: 1.8±0.15V, PLL: 1.8±0.15V
- Packages
  - S2D13P04B00B100  
PFPGA10UX121 (10mm×10mm×1.2mm, 0.8mm-pitch)
  - S2D13P04F00A100  
QFP15-100pin (14mm×14mm×1.7mm, 0.5mm-pitch)

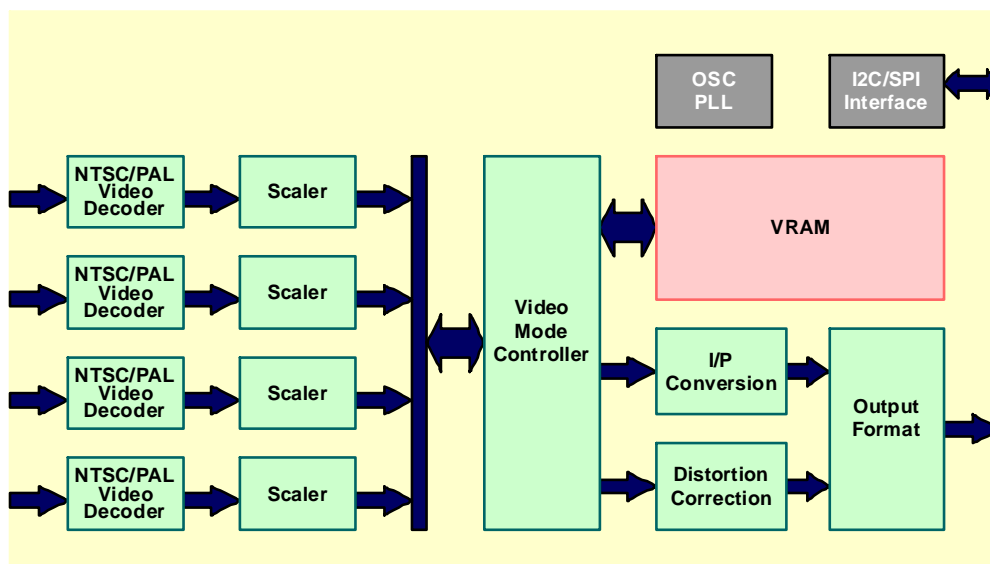
\*1 The number of pixels per line may not comply with ITU-R BT.656 standard.

\*2 In Merge Mode or Compression Mode, outputs are compatible with Interlaced output.

\*3 When the distortion correction function is enabled, the interlaced output is not supported.

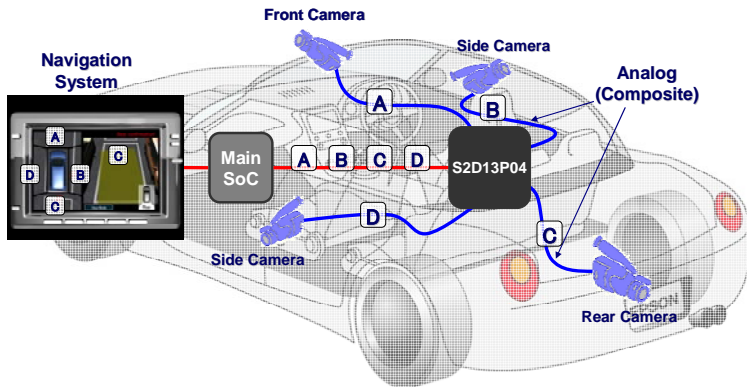
\*4 In the Compression Mode or Auto Scan Mode, the distortion correction is not supported.

### ■ BLOCK DIAGRAM

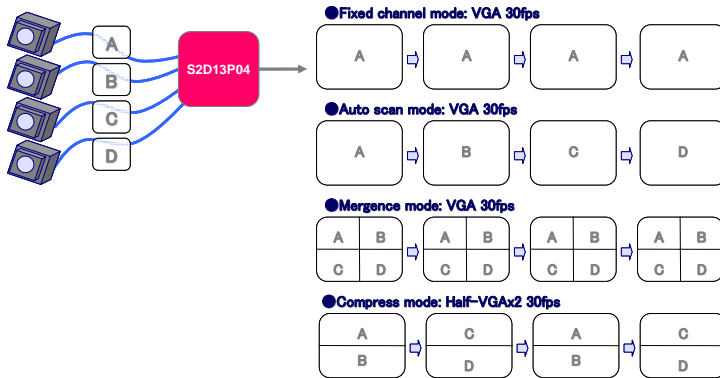


# S2D13P04

## ■ USE CASE



## ■ OUTPUT DATA FORMAT IMAGE



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Document code: 412395701  
 First issue July, 2012 in Japan

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