Technical Description

General Description

The OV550 Camera Bridge Processor is a low cost, enhanced single-chip processor for USB 2.0 PC camera applications, capable of supporting up to 5.0 Megapixel sensors for game console applications. When combined with an OmniVision VGA, 1.3 Mpixel, 2.0 Mpixel, 3.2 Mpixel, or 5.0 Mpixel digital CAMERACHIP™, the OV550 comprises an integrated USB 2.0 camera system, with no additional USB transceiver or DRAM required. The OV550 also supports full video operation.

Features

General Features
- Low cost, low powered image processor that supports up to 5.0 Megapixel sensors
- Maximum pixel clock running at 48 MHz: 30 fps for 1.3MP Raw mode, 15 fps for 1.3MP YUV mode
- Supports USB Video Class with uncompressed format
- Serial Camera Control Bus (SCCB) Master Controllers

CAMERACHIP Interfaces
- Up to 5 Megapixel
- 10-bit RGB interface
- 8-bit YUV interface

Host Interface - USB 2.0
- Supports USB Video Class with uncompressed format
- Supports both isochronous and bulk endpoint for video transfer

Embedded 8-bit Microcontroller
- Embedded 512-Byte data memory
- Embedded 12KB program memory

Miscellaneous
- Embedded 3.3V to 1.8V regulators
- Embedded PLL
- Optional external serial EEPROM
- General Purpose I/O (GPIO)
- Power-down control

Ordering Information

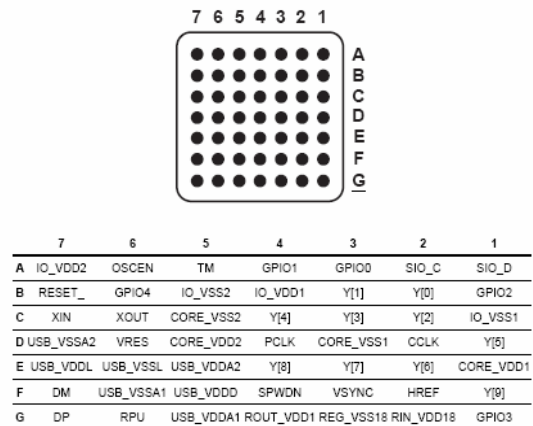| Product	Package
OV0550-BB30	BGA-49

Applications

- USB 2.0 applications combined with the following OmniVision CAMERACHIP families:
  - OV56xx (5.0 MegaPixel)
  - OV36xx (3.2 MegaPixel)
  - OV26xx (2.0 MegaPixel)
  - OV96xx (1.3 MegaPixel)
  - OV86xx (SVGA)
  - OV76xx (VGA)
  - OV66xx (CIF)

NOTE: The OV550 supports digital image sensors up to 5.0 Megapixel resolution. However, it will not support analog image sensors (OVx9xx or OVx4xx products)

Key Specifications

Power Supply	Core	1.8 V
	I/O	3.3V
	Regulator Input	3.3V
Power Requirements	Active	TBD
	Standby	TBD
Temperature Range		TBD
Package Dimensions		6.00 mm x 6.00 mm

Figure 1   OV529-B49 Pin Diagram

	7	6	5	4	3	2	1
A	IO_VDD2	OSCEN	TM	GPIO1	GPIO0	SIO_C	SIO_D
B	RESET_	GPIO4	IO_VSS2	IO_VDD1	Y[1]	Y[0]	GPIO2
C	XIN	XOUT	CORE_VSS2	Y[4]	Y[3]	Y[2]	IO_VSS1
D	USB_VSSA2	VRES	CORE_VDD2	PCLK	CORE_VSS1	CCLK	Y[5]
E	USB_VDDL	USB_VSSL	USB_VDDA2	Y[8]	Y[7]	Y[6]	CORE_VDD1
F	DM	USB_VSSA1	USB_VDDD	SPWDN	VSYNC	HREF	Y[9]
G	DP	RPU	USB_VDDA1	ROUT_VDD1	REG_VSS18	RIN_VDD18	GPIO3

Functional Description

Figure 2 shows the functional block diagram of the OV550 processor. The OV550 includes:

- Camera Interface
- USB Converter
- Host Controller
- SCCB Master Controller
- Microcontroller
- System Controller

Camera Interface

The Camera Interface takes either 10-bit RGB raw data or 8-bit YUV data from a maximum 5 Megapixels image sensor. The maximum pixel clock runs at 48MHz to support 30 fps for 1.3 Megapixel RAW mode or 15 fps for 1.3 Megapixel YUV mode.

The Camera Interface can interface with the image sensor CCIR656 and CCIR601 modes.

Host Controller

The OV550 uses USB2.0 to communicate with the Host Controller and supports USB video class with uncompressed format.

SCCB Master Controller

The SCCB Master Controller controls sensor registers. It is possible for the SCCB Master Controller to interface with an optional external EEPROM for downloading firmware to the program memory of the Microcontroller when the system is powered up.

Microcontroller

The OV550 is embedded with an 8-bit microcontroller with 512-Byte data memory and 12KB program memory. It provides the flexibility of decoding protocol commands from the host for controlling the system, as well as fine-tuning image qualities.

System Controller

The System Controller provides some system functions, such as GPIO and power down functions.

Figure 2   Functional Block Diagram