



Genesys Logic, Inc.

GL862

USB 2.0 PC Camera Controller

Product Overview

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GENERAL DESCRIPTION

The GL862 is a high performance USB 2.0 UVC compliant controller for PC Camera and NB camera application. With the GenesysLogic's highly recognized self-developed USB high-speed transceiver, GL862 provides up to 30 fps at VGA or capture still images at 2 Mega pixels for fulfilling the mass bandwidth demand of video transferring. GL862 also supports USB isochronous mode to provide certain bandwidth to insure user can get satisfied usage experience on video application even running high bandwidth consumption devices concurrently.

The GL862 is compliant with USB Video Class 1.1, can work with Microsoft native driver that already bundled at WinXP SP2 and Vista. It makes you use USB PC Camera as you use an USB flash disk. Additionally, the GL862 provides an alternative proprietary driver to meet better image performance and special function requirement.

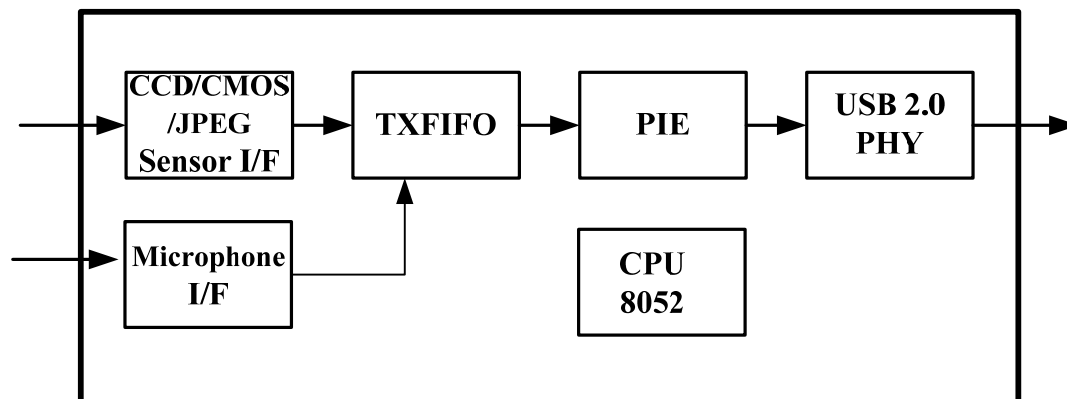
The GL862 integrates a flexible sensor interface to make it easily to couple with versatile CMOS sensors on market. The GL862 is low power consumption and low operation temperature that efficiently avoid the noise signals of sensor induced by USB camera controller

FEATURES

- USB Function
 - Compliant with USB 2.0 high-speed and full-speed.
 - Complaint with USB Video Class 1.1.
 - Support USB 2.0 Isochronous Video pipe to 24MB/s.
 - Support 6 USB endpoints: Control PIPE, Isochronous IN, Interrupt OUT, Interrupt IN, Isochronous IN and Isochronous IN/OUT
- System
 - Embedded 8052 micro-controller, operate @ 15 MHz clock.
 - Built-in 5V to 3.3V regulator
 - 3.3V/1.8V operation
 - Built-in PLL – support frequency (20~100MHz)
 - Support on-line firmware upgrade
 - The sensor, UVC, property control setting stored in external EEPROM (24Cxxx)
 - Support alternative proprietary driver to enhance image performance
- Sensor Interface
 - Support up to 3M CMOS Soc-Sensor
 - Support UVC uncompressed YUY2 payload
 - Support UVC MJPEG payload
 - Support 54MHz pixel clock
 - Support I2C for sensor control
- Hardware ISP
 - GAIN control for YUV
 - GAMMA function for Y
 - Window Y value & absolute value Average calculation
- Frame Rate
 - Non-UVC mode, worked with proprietary driver
 - Support YUV/RGB/I420 format
 - Video stream up to : 12 fps in UXGA, 15 fps in SXGA, 30 fps in VGA
 - UVC Class mode, worked with OS native driver
 - Support UVC uncompressed YUY2 payload
 - Video stream up to : 5 fps in UXGA, 7 fps in SXGA, 30 fps in VGA
 - Still image captured up to UXGA
- USB Certification
 - Pass the WHQL test of WinXP and Vista
 - Pass the USB-IF UVC test
- Platform Support
 - WinXP32/64, Vista 32/64,
 - MacOS X 10.4.8 and later
 - Linux UVC driver
- Package
 - Available at 100pin QFP and 48pin/46pin QFN/LQFN package
 -

BLOCK DIAGRAM

Function Block



- **CCD Module/CMOS Sensor Interface**

GL862 can link with popular CMOS sensor on market for PC camera application. GL862 can be configured by different sensor requirement. If sensor is acting as master, GL862 can accept HSYNC/VSYSN from sensor. If GL862 is configured as a master HSYNC/VSYSN will be provided by GL862 to sensor. GL862 keep the most flexibility to fit most of the sensors. The detail of configuration needs to refer to GL862 Application Note. For most sensors no matter of YUV format or RGB format, they can be easily transferred image data to PC by GL862.

- **TXFIFO**

GL862 build in 6K byte internal buffer for USB high bandwidth application. This 6K internal buffer can be used as transmitted buffer of isochronous pipe. In USB specification, the highest bandwidth of isochronous pipe is 24Mbyte/second, that can be easily derived to maximum frame rate depending on configuration. For example, frame rate can be easily achieved to 30 frames per second if image size is 640 x 480 if raw data output and sensor clock is 15M.

- **PIE**

PIE handles the USB protocol defined in chapter 8 of *USB specification Revision 2.0*. It co-works with CPU to play the role of the chip's kernel. The main functions of PIE include the state machine of USB protocol flow, CRC check, PID error check, and timeout check. Unlike USB1.1, bit stuffing/de-stuffing is implemented in UTMI, not in PIE.

- **USB 2.0 PHY (UTMI)**

UTMI handles the low level USB protocol and signaling. It's designed based on the Intel's UTMI specification 1.01. The major functions of UTMI logic are to handle the data and clock recovery, NRZI encoding/decoding, Bit stuffing /de-stuffing, supporting USB2.0 test modes, and serial/parallel conversion.

- **CPU**

CPU is the micro-processor unit of GL862. It is an 8-bit 8052 processor with 16KB ROM and 256 bytes RAM. It operates at 15Mhz clock to decode the USB command issued from host and then prepares the data to respond to the host. In addition, μ C can handle GPIO (general purpose I/O) settings and reading content of EEPROM to support high flexibility for customers of different configurations of chip. These configurations include self/bus power mode setting, individual/gang mode setting, downstream port number setting, device removable/non-removable setting, and PID/VID setting.

Operation Mode

For customized firmware, flash memory can use as external program memory of CPU. This is for customer to develop their firmware. This is only available for 100-pin package type.

With Flash Memory

- Only available in 100-pin QFP package
- Force EXTCPU = 0
- GPIO10 pull-down
- GPIO13/GPIO14 used as serial bus to configure sensor

Without Flash Memory

- If 100 pin, set EXTCPU = 0
- GPIO10 pull-up
- GPIO13/GPIO14 are used as serial bus to configure sensor