Genesys Logic, Inc.

GL3220

USB 3.0 Multi-Slot
Memory Card Reader Controller

Product Overview

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GENERAL DESCRIPTION

GL3220 is a super speed USB 3.0 compliant Mulit-LUN card reader controller which can support various types of memory cards, such as CompactFlash™, Secure Digital™ (SD), SDHC, miniSD, microSD (T-Flash), MultiMediaCard™ (MMC), RS-MMC, MMCmicro, MMCmobile, Memory Stick™ (MS), Memory Stick Duo™ (MS Duo), High Speed Memory Stick™ (HS MS), Memory Stick PRO™ (MS PRO), Memory Stick PRO™ Duo (MS PRO Duo), Memory Stick PRO-HG™ (MS PRO-HG), MS PRO Micro and xD-picture card on one chip. It also supports next generation high density memory cards (Capacity up to 2TB), such as SDXC and Memory Stick XC, and next generation high speed memory cards, SD3.0 UHS-I cards.

The GL3220 integrates a high speed 8051 microprocessor and a high efficiency hardware engine for the best data transfer performance between USB and various memory card interfaces. It supports ISP (In System Programming) for firmware upgrade from the external SPI Flash via USB port. It also integrates 5V to 3.3V and 3.3V to 1.2V regulators and power MOSFETs which can reduce the system BOM cost.

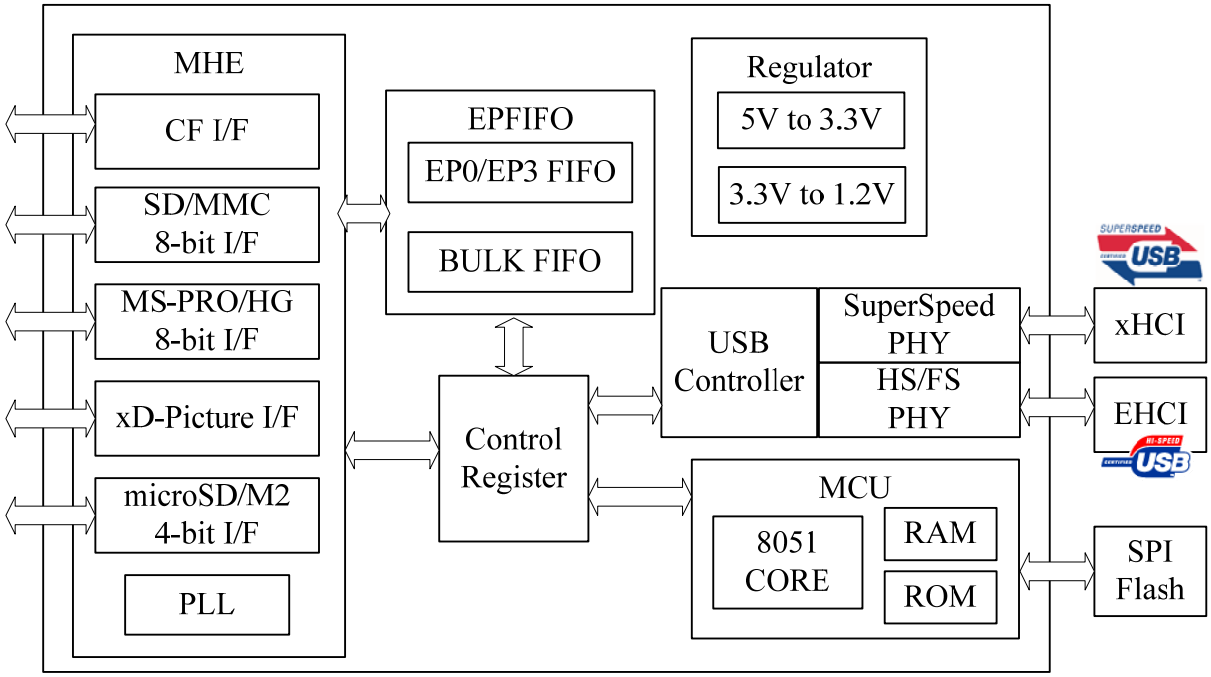
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FEATURES

- USB specification compliance
  - Comply with Universal Serial Bus 3.0 Specification rev. 1.0 (USB 3.0)
  - Comply with Universal Serial Bus Specification rev. 2.0 (USB 2.0)
  - Comply with USB Mass Storage Class Specification rev. 1.0
  - Support USB Mass Storage Class Bulk-Only Transport (BOT)
  - Support 1 device address and up to 4 endpoints: Control (0) / Bulk Data Write Out (1) / Bulk Data Read In (2) / Interrupt In (3)
  - Support 5 Gbps SuperSpeed, 480 Mbps high-speed, and 12 Mbps full-speed transfer rates
- Integrated USB building blocks
  - USB2.0 transceiver macro (UTM), Serial Interface Engine (SIE), embedded Power-On Reset (POR)
- Embedded high speed 8051 micro-controller
- High efficient DMA hardware engine improves transfer rate between USB and flash card interfaces
- Support CompactFlash™ v6.0 with PIO mode 6 / Ultra DMA mode 7 and LBA48 (Capacity up to 144PB)
- Support Ssecure Digital™ v1.0 / v1.1 / v2.0/ SDHC / SDXC (Capacity up to 2TB)
- Support Secure Digital™ v3.0 UHS-I (Ultra High Speed): SDR12/SDR25/SDR50/DDR50/SDR104
- Compliant with MultiMediaCard™ (MMC)
  - MMC specification v3.x / v4.0 / v4.1 / v4.2 / v4.3 / v4.4
  - x1 / x4 / x8 bit data bus
- Support Memory Stick™ / Memory Stick PRO / Memory Stick PRO Duo / Memory Stick Micro /Memory Stick PRO-HG / Memory Stick XC (Capacity up to 32GB)
  - Compliant with Memory Stick Series Specification: MS v1.43, MS PRO v1.05, MS Micro v1.04 (MS HG Micro v1.00), MS PRO-HG Duo 1.03, MS XC Duo v1.00, MS XC-HG Duo v1.00, MS XC Micro v1.00 and MS XC-HG Micro v1.00
  - Support Read/Write quad data access (512Bytex4) for MS PRO-HG to enhance the transmission rate
- Support xD-PictureTM v1.2C Type M/H
- Support ISP (In System Programming) for firmware upgrade from the external SPI Flash via USB port
- On-Chip power MOSFETs for supplying flash media card power
- On-chip 5V to 3.3V and 3.3V to 1.2V regulator
- On board 25 MHz Crystal driver circuit
- Pass the USB-IF Test Procedure for SuperSpeed product, TID:340000020
- Package available in 128 pin LQFP that can support 5 LUNs: CF, SD, MS, xD and microSD/M2

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BLOCK DIAGRAM



Functional Block Diagram

Super Speed and HS/FS PHY

The transceiver macro cell is the analog circuitry that handles the low level USB protocol and signaling, and shifts the clock domain of the data from the USB to one that is compatible with the general logic.

USB Controller

The USB Controller, which contains the USB PID and address recognition logic, and other sequencing and state machine logic to handle USB packets and transactions.

EPFIFO

Endpoint FIFO includes Control FIFO (FIFO0), Interrupt FIFO (FIFO3), Bulk In/Out FIFO

- **EP0 FIFO** FIFO of control endpoint 0. It is 512-byte FIFO and used for endpoint 0 data transfer.
- **EP3 FIFO** 32-byte depth FIFO of endpoint 3 for status interrupt
- **Bulk In/Out FIFO** It can be in the TX mode or RX mode:
  1. It can be transmit/receive 512-byte data of USB 2.0 and 1K-byte data of USB 3.0 continuously.
  2. It can be directly accessed by micro-controller

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MCU

8051 micro-controller inside.

- **8051 Core** Compliant with Intel 8051 high speed micro-controller
- **ROM** Firmware code on ROM
- **SRAM** Internal RAM area for MCU access

MHE (Media Hardware Engine)

Media Interface: CF/xD/SD/MMC/MS/MS PRO/MS PRO-HG

Regulator

- **5V to 3.3V** 3.3V Power Source
- **3.3V to 1.2V** 1.8V Power Source

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