Genesys Logic, Inc.

GL852GC

USB 2.0 MTT Hub Controller

Product Overview

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GENERAL DESCRIPTION

GL852GC is Genesys Logic's premium 4-port hub solution which fully complies with Universal Serial Bus Specification Revision 2.0. GL852GC implements multiple TT* *(Note1)* architecture that provide dedicated TT* to each downstream (DS) ports, which guarantee Full-Speed(FS) data passing bandwidth when multiple FS device perform heavy loading operations. The controller inherits Genesys Logic's cutting edge technology on cost and power efficient serial interface design. GL852GC has proven compatibility, lower power consumption figure and better cost structure above all USB 2.0 hub solutions worldwide.

GL852GC implements multiple hub configuration features onto internal mask ROM, which traditionally requires one external EEPROM. The microprocessor detects general purpose I/O (GPIO) status during the initial stage to configure hub settings such as (1) number of DSport, (2) declare of compound device (3) gang/individual mode selection…etc. External EEPROM can be removed if no vendor specified PID/VID or product string is required for the application.

GL852GC also complies with USB-IF battery charging specification rev1.2, which can support fast charging function, allowing portable device can draw up to 1.5A from GL852GC charging downstream ports (CDP[1]) or dedicated charging port (DCP[2]).

GL852GC supports three package types, summarized as below table. LQFP48 package provides full hub features such as (1) two-color (green/amber) status LEDs for each DS ports, (2) Individual/Gang mode power management scheme that indicates DS port over-current events. (3) Number of DS ports setting configured by GPIO setting (4) non-removable declaration configured by GPIO setting (5) Support both 93C46 and 24C02 EEPROM (6) power switch polarity selections…etc. QFN28/SSOP28 package support only partial hub features but provide smaller footprint that targets space limited PCB layout environments such as embedded system or UMPC/MID applications.

Package Type	# of DS Ports	Port # Config.	Non-removable Declaration	Power Mgmt.	# of CDP/DCP Support	LED Support	EEPROM
LQFP 48	4	GPIO	EEPROM/ GPIO	Individual/Gang	4	Green/Amber	93C46/ 24C02
QFN 28	4	EEPROM	EEPROM	Individual/Gang	4	N/A	24C02
SSOP 28	4	EEPROM	EEPROM	Gang	4	N/A	24C02

GL852GC Package – Feature Summary

*Note: TT (transaction translator) is the main traffic control engine in an USB 2.0 hub to handle the unbalanced traffic speed between the upstream port and the downstream ports.

[1] CDP, charging downstream port, the Battery Charging Rev.1.2-compliant USB port that does data communication and charges device up to 1.5A.
[2] DCP, dedicated charging port, the Battery Charging Rev.1.2-compliant USB port that only charges devices up to 1.5A, similar to wall chargers.

FEATURES

- Compliant with USB specification revision 2.0
  - Configurable 4/3/2 downstream ports
  - Upstream port supports both high-speed (HS) and full-speed (FS) traffic
  - Downstream ports support HS, FS, and low-speed (LS) traffic
  - 1 control pipe (endpoint 0, 64-byte data payload) and 1 interrupt pipe (endpoint 1, 1-byte data payload)
  - Backward compatible to USB specification revision 1.1
- Compliant with USB battery charging specification revision 1.2
  - Turning its downstream port from a standard downstream port (SDP) into charging downstream port (CDP) or Dedicated Charging Ports (DCP).
  - Enables portable device to charge from VBUS even when the USB bus is in suspend.
- On-chip 8-bit micro-processor
  - RISC-like architecture
  - USB optimized instruction set
  - Dual cycle instruction execution
  - Performance: 6 MIPS @ 12MHz
  - With 64-byte RAM and 4K internal ROM
  - Support customized PID, VID by reading external EEPROM
- Multiple Transaction translator (MTT)
  - MTT provides respective TT control logics for each downstream port.
- Each downstream port supports two-color status indicator, with automatic and manual modes compliant to USB specification revision 2.0
- Built-in upstream port 1.5KΩ pull-up and downstream port 15KΩ pull-down resistors
- Support both individual and gang modes of power management and over-current detection for downstream ports. Support both low/high-enabled power switches.
- Conform to bus power requirements of USB 2.0 specification
- Automatic switching between self-powered and bus-powered modes
- Integrate USB 2.0 transceiver
- Embedded PLL support external 12 MHz crystal / Oscillator clock input
- Optional 27/48 MHz Oscillator clock input (Only available in LQFP48 package)
- Support compound-device (non-removable in downstream ports) by I/O pin configuration (Only available in LQFP48 package)
- Number of Downstream port can be configured by GPIO without external EEPROM (Only available in LQFP48 package)
- Operate on 5V and 3.3V (Built-in 5V to 3.3V regulator)
- Internal power-fail detection for ESD recovery
- ESD protection up to 5KV of HBM (Human Body Model) by MIL-STD-883H standard
- Available package type: 48 pin LQFP, 28 pin QFN and 28 pin SSOP
- Applications:
  - Stand-alone USB hub / USB docking
  - UMPC/MID, motherboard on-board applications
  - Consumer electronics built-in hub application
  - Monitor built-in hub
  - Embedded systems
  - Compound device to support USB hub function such as keyboard hub applications

BLOCK DIAGRAM