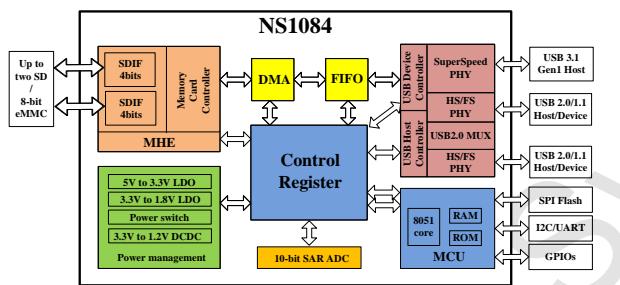


NS1084 USB 3.0 Flash Card Controller for iDevice

Introduction

NS1084 is a high-performance USB 3.0 Flash Card controller designed specifically for iDevice applications. It is fully in compliance with MFi Specification, supporting iAP2 protocols and EA Native Transport, Device Powered, and App Launch. It also supports MFi USB Role Switch and USB OTG. NS1084 is compatible with USB 3.1 Gen1 (5Gbps), Hi-Speed, and Full-Speed. On one side, NS1084 connects with up to two USB interfaces such as Type-A, Type-C, and Apple Lightning Interface. On the other side, it connects with up to two 4-bit flash media cards, such as Secure Digital (SD) and microSD (T-Flash); or one 8-bit flash card such as Embedded-MultiMediaCard (eMMC).

Block Diagram



Highlights

- Two low-power USB 2.0 PHY specifically optimized for iDevice applications. Each PHY transceiver can be configured to either USB 2.0/1.1 Host or USB 2.0/1.1 device. An integrated USB 2.0 MUX enables data selection from one of the USB 2.0 transceivers.
- Support charging mode detection compatible with specifications from Apple, Samsung, and USB BC1.2, allowing an iDevice to be simultaneously charged from a USB port or a power adapter at the maximum supported charging current during USB data transfer.
- Capable of operating SD card at different frequencies for Read and Write independently. This patented technology guarantees the best performance of Read and Write while meeting the MFi requirement of the maximum current limit.

Features

- Support Apple MFi Accessory Interface Specification.
- Support Apple Accessory iAP2 protocol, featuring EA Native Transport, Device Powered, and APP launch.
- Support Apple MFi USB Role Switch and USB OTG.
- Support Apple, Samsung, and USB BC1.2 charging detection.
- Detection of maximum supply current from a USB port or a power adapter at 500mA/1A/1.5A/2.1A/2.4A; and capable of charging iDevice at 500mA/1A/2.1A/2.4A.
- Configuring SD card read and write frequencies independently from 15 to 96MHz for up to 9 levels.
- Support USB 3.0 Specification v1.0, USB Type-C Specification v1.1, and USB Specification v2.0.
- Support USB Mass Storage Class, Bulk-Only Transport
- Support USB 3.0 U0/U1/U2/U3 (P0/P1/P2/P3) and USB 2.0 L0/L1/L2 power saving modes.
- Support Secure 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/DDR200.
- Support two x4 flash media cards operating in RAID0 mode to double both speed and capacity, or operating in JBOD mode to only double card capacity.
- Support eMMC specification v4.5 HS200 mode.
- Spread Spectrum Clocking (SSC) for flash media card to minimize EMI.
- Support SPI, I2C, UART communication.
- Support firmware booting from SPI Flash or SD card.
- Support firmware upgrade to SPI Flash or SD card either from PC or from iDevice.
- Support high reliability operation with two copies of the firmware image stored in SPI Flash or SD card.
- On-chip power MOSFETs for supplying SD card power.
- Support up to four dedicated LED controllers.
- On-chip high efficiency 3.3V to 1.2V DC-DC regulator.
- On-chip 5V to 3.3V and 3.3V to 1.8V regulators.
- On-chip 10-bit 50kHz SAR ADC.
- Package available in 48-pin 6mmx6mm (RoHS) QFN.

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