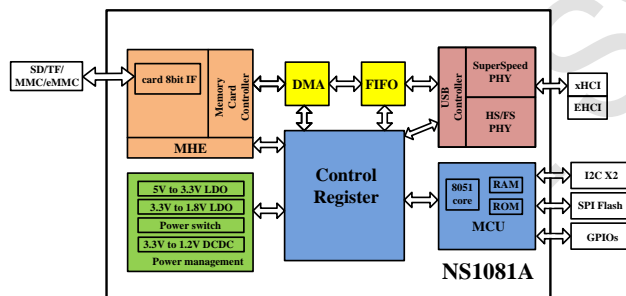# NS1081A USB 3.0 Flash Card Controller for iDevice

## Introduction

NS1081A is a high-performance USB 3.0 Flash Card Controller designed specifically for iDevice Accessory. It is fully in compliance with MFi Accessory Interface Specification, supporting iAP2 protocols and features such as EA Native Transport, Device Powered, and App Launch. On one side, NS1081A connects with USB interface (e.g. Type-A, Type-C) or Apple Lightning Interface, compatible with USB 3.1 Gen1 (5Gbps), USB Hi-Speed and Full-Speed. On the other side, it connects with up to two 4-bit flash media cards, compatible with various standards such as Secure Digital (SD), microSD (T-Flash), Embedded-MultiMediaCard (eMMC), etc. It also supports high density memory cards with capacity up to 2TB, and high speed memory cards including SD3.0 UHS-I cards and eMMC4.5 HS200.

## Block Diagram



## Highlights

- Integrated a very low-power USB 2.0 transceiver specifically optimized for iDevice Accessory.

- Support charging mode detection compatible with specifications from Apple, USB BC1.2 and USB Type-C. During data transfer, an iDevice can be simultaneously charged from a USB port or a power adapter at the maximum supported charging current.

- Capable of operating flash media cards at different frequencies for Read and Write. This patent-pending 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.

- Detection of maximum supply current from a USB port or a power adapter at 500mA, 1A, 1.5A, 2.1A, 2.4A, or 3A; and capable of charging iDevice at 500mA, 1A, 2.1A, or 2.4A.

- Support USB 3.0 Specification Revision 1.0, USB Type-C Specification Revision 1.1, USB Specification Revision 2.0.

- Support USB Mass Storage Class, Bulk-Only Transport Specification.

- 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

- Support Secure Digital v3.0 UHS-I (Ultra High Speed)：SDR12/SDR25/SDR50/DDR50/SDR104.

- Support MultiMediaCard (MMC) and Embedded MultiMediaCard (eMMC) specification v4.41/v4.5 x1/x4/x8 bit data bus and DDR x4/x8 bit data transfer mode.

- Support Embedded MultiMediaCard (eMMC) specification v4.5 HS200 data transfer mode.

- Support two x4 flash media cards. The two flash media cards can operate in RAID0 mode to double the speed and capacity; or in JBOD mode to only double the capacity but with low power consumption.

- Support SPI and I2C interface for firmware customization and MFi authentication.

- Support firmware upgrade to SPI Flash from PC and iDevice.

- Support Win10/Win8/Win7/Vista/XP/2000/Me, Linux and Mac OS 9.x/10.x.

- Support two dedicated LED controllers.

- On-chip high efficiency 3.3V to 1.2V DC-DC regulator, and 5V to 3.3V, 3.3V to 1.8V regulators.

- Package available in 48 pin 6x6 (RoHS) QFN.

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