

## Features

- **Memory Card Formats**
  - SD Host Controller Spec v3.0 (SDXC)
  - SDIO Spec v3.0
  - SD Memory Spec v3.0
  - eSD Memory Spec v2.1
  - MMC Spec v4.4 (eMMC)
  - MS Pro v1.02
  - MSPro-HGDuo Spec v1.02
  
- **IP Details**
  - Supports two slots
  - Built-in Master DMA for efficient data transfer
  - SD - Secure Digital Memory Card
    - 25/50/104/208 MHz
    - 1, 4 bit of data
  - SDIO - SD Input / Output
    - 25/50/104/208 MHz
    - 1, 4 bit of data
  - MMC - MultiMedia Card
    - 26/52/104 MHz
    - 1,4, 8 bit of data
  - MS - Memory Stick
    - 20/40 Mhz
    - 1, 4, 8 bit data
  - MS Pro - Memory Stick Pro
    - 20/40 MHz
    - 1, 4, 8 bit data

- **End Products**
  - SSD - Solid State Drives
  - Picture frames
  - Laptops
  - Printers
  - Digital Cameras
  - Smart Phones
  - Games Consoles

## SD / SDIO / eMMC / MSPro / MSPro-Duo Host Controller IP

### Overview

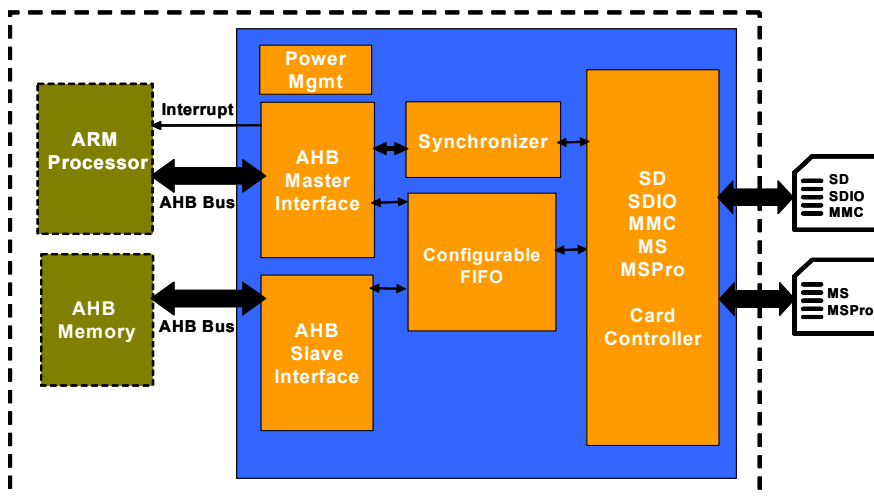
As the mobile industry continues to grow, the requirements for both internal and external memory are increasing at an exponential rate. At the system level, memory interfaces with larger capacities, smaller form factor and faster access times in addition to support for multiple industry standards are needed.

Arasan Chip Systems' SD / SDIO / eMMC / MS / MSPro IP is a highly integrated host controller IP solution that supports five key memory and I/O technologies: 1) SD, 2) SDIO, 3) MMC, 4) MS and 5) MSPro. This IP handles all of the timing and interface protocol requirements to access these media as well as processing the commands in hardware thereby scaling in both performance and access speeds.

It supports connections to two slots and performs multi-block writes and erases that lowers access overhead. In addition, a host can utilize this IP to boot directly from an attached eMMC memory, thereby simplifying system initialization during power up. The host accesses and configures this IP using a standard 32-bit AHB bus interface.

Arasan's thorough verification methodology takes the risk out of integration of this functionality. As an Executive Member of the SD Association and a member of the MMCA body (now part of JEDEC), Arasan is a leading provider of quality IP ensuring SoC designers risk-free integration of this advanced functionality. In addition to providing the SD / SDIO / eMMC / MS / MSPro IP core, Arasan provides a family of different memory solutions to address a variety of needs. Arasan provides verification IP, test environment and a hardware development kit to ease integration into an SoC.

SD / SDIO / eMMC / MSPro / MSPro-Duo IP Functional Block



# SD / SDIO / eMMC / MSPro / MSPro-Duo Host Control-

## SD / SDIO / eMMC / MS / MSPro Controller

This IP core is an integration of key industry memory and storage specifications into a single solution. Optimized for size and performance, it shares common functional blocks to minimize the size implementation. Similar to the family of memory controllers, it can support embedded or multiple external slots. A variety of host interfaces are supported.

## SD, MMC

Arasan's SD (Secure Digital) and MMC (MultiMedia Card) controllers provides high-speed, low-power data storage and access. The controller can be used with any type of flash memory interface and supports card locking, write protection, password features, and hot insertion or removal. It operates up to 52 MHz and supports all SD bus modes - SPI, SDI, and SD4 bit SD and MMC bus modes - SPI, MMC1, MMC4 and MMC8 bit.

## SDIO

The SDIO interface serves as an expansion bus which is used to add new functionality to a system in a modular fashion.

## MSPro, MSPro-Duo

The controller supports both serial and parallel access modes. Designed to enable high-quality and large capacity storage, it is compatible with "MagicGate" content protection technology. The core supports the many variations of the standard including Duo, M2, PRO-HG, etc.

## Target Applications

Primarily focused on mobile applications requiring memory controllers such as smartphones and similar application-rich systems, Arasan's SD / SDIO / eMMC / MS / MSPro IP is also applicable to product categories such as picture frames, cameras, printers, MIDs, UMDs, PDAs and other consumer electronics.

## Benefits:

- Fully compliant core with proven silicon
- Premier direct support from Arasan IP core designers
- Easy-to-use industry standard test environment
- Unencrypted source code allows easy implementation
- ReUse Methodology Manual guidelines (RMM) compliant verilog code ensured using Spy-glass

## Deliverables:

- RMM Compliant Synthesizable RTL design in Verilog
- Easy-to-use test environment
- Synthesis scripts
- Technical documents

## Supported Platforms/Simulators:

- Platforms: Solaris, Unix, Linux, WinCE, and Win XP
- Verilog simulators: Synopsys VCS, Cadence NC-Verilog, MTI ModelSim-Verilog

Various Multi-Card Applications



## Arasan Chip Systems, Inc.

2010 N. First St. Suite #510  
San Jose CA 95131  
Phone: 408-282-1600  
Fax: 408-282-7800  
E-mail: [sales@arasan.com](mailto:sales@arasan.com)

## Data Sheet Links:

Memory & Storage IP Core data sheet:  
<http://www.arasan.com/datasheets/login.php>

For a complete directory of Arasan IPs, please visit:  
[www.arasan.com](http://www.arasan.com)