SDMMC: Secure Digital and MultiMediaCard
XMC™ microcontrollers
September 2016
Agenda

1. SD/SDIO/MMC details
2. SDMMC use cases and benefits
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2. SDMMC use cases and benefits
Secure Digital and MultiMediaCard interface (SDMMC) provides an interface between SD/SDIO/MMC cards and the AHB bus. The SDMMC module is able to transfer a maximum of 24 MB/sec for SD cards and 48 MB/sec for MMC cards.

**Key feature**

- Compliant with the SD and MMC standards
- Supports read wait control and suspend/resume operation

**Customer benefits**

- Software compatibility, easy to port existing code to XMC™4000 device
- Simpler handling of over run and under run events
Agenda

1. SD/SDIO/MMC details

2. SDMMC use cases and benefits
SDMMC
Compliant with the SD and MMC standards

XMC™4000 supported SD and MMC standards
- SD card host controller version 2.0
- SD physical layer specification version 2.0
- SDIO card specification version 2.0
- SD memory card security specification version 1.01
- MMC specification version 3.31, 4.2 and 4.4
- Fully compatible with earlier versions of MMC
- Supports SD, SDIO, SDHC and MMC cards at up to 48 MHz

Source: https://www.sdcard.org
SDMMC
Read wait control and suspend/resume

› Supports read wait control and suspend/resume operation

Read operation

SDMMC
Data FIFO

Read wait

SDMMC
FIFO full

Read/write suspend

SDMMC
SD2.0/SDIO2.0/MMC4.4 Device

Read/ write operation

SDMMC
SD2.0/SDIO2.0/MMC4.4 Device

SDMMC
SD2.0/SDIO2.0/MMC4.4 Device

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SDMMC
System integration

› Target applications
  - Connectivity
  - Human machine interface
  - General purpose

› Interconnection to Nested Vector Interrupt Controller (NVIC)
  - Trigger interrupt if any interrupt bits are set in the interrupt status register

Interconnection to PORTS
- SDCD signal indicates card detection
- SDWC signal indicates SD card read protection
- RST signal triggers hardware reset to card
- BUS_POWER signal controls power supply to the card
- LED signal (LED light) indicates that card is being accessed
- CLK signal indicates clock supplied to the card, or feedback clock from the pad
- DATA signal transmits data to the card, or receives data from the card
- CMD signal sends command in the cmd line, and receives response from the SD/MMC card
SDMMC
SD/SDIO/MMC details

› SD/ SDIO transmission details
  - Transfers data in 1-bit and 4-bit SD modes
  - Cyclic redundancy check CRC7 for command and CRC16 for data integrity

› MMC card interface
  - Supports MMC Plus and MMC Mobile
  - MMC card detection for insertion/removal
  - Error Correction Codes (ECC)

› Miscellaneous
  - Two 512 byte buffer for data transfers between core and cards
  - Handles FIFO over run and under run conditions
  - Software support by DAVE™ Apps and low-level driver, including FAT32 file system for direct PC to XMC™4000 file exchange
## Support material

### Collaterals and Brochures
- Product Briefs
- Selection Guides
- Application Brochures
- Presentations
- Press Releases, Ads

- [www.infineon.com/XMC](http://www.infineon.com/XMC)

### Technical Material
- Application Notes
- Technical Articles
- Simulation Models
- Datasheets, MCDS Files
- PCB Design Data

- [www.infineon.com/XMC](http://www.infineon.com/XMC)
- Kits and Boards
- DAVE™
- Software and Tool Ecosystem

### Videos
- Technical Videos
- Product Information Videos

- [Infineon Media Center](http://Infineon Media Center)
- [XMC Mediathek](http://XMC Mediathek)

### Contact
- Forums
- Product Support

- [Infineon Forums](http://Infineon Forums)
- [Technical Assistance Center (TAC)](http://Technical Assistance Center (TAC))
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