



## Ultra Fast USB 2.0 Multi-Slot Flash Media Controller

### PRODUCT FEATURES

### Data Brief

#### General Description

The SMSC USB2250/50i/51/51i is a USB 2.0 compliant, Hi-Speed mass storage class peripheral controller intended for reading and writing to more than 24 popular flash media formats from the CompactFlash<sup>®</sup> (CF), SmartMedia<sup>™</sup> (SM), xD-Picture Card<sup>™</sup> (xD)<sup>1</sup>, Memory Stick<sup>®</sup> (MS), Secure Digital (SD), and MultiMediaCard<sup>™</sup> (MMC) families.

The SMSC USB2250/50i/51/51i is a fully integrated, single chip solution capable of ultra high performance operation. Average sustained transfer rates exceeding 35 MB/s are possible if the media and host can support those rates.

#### General Features

- 128-pin VTQFP (14x14 mm) lead-free RoHS compliant package
- Targeted for applications in which single or "combo" media sockets are used
- Supports multiple simultaneous card insertions
- Flexible assignment of number of LUNs and how card types are associated with the LUNs
- Hardware-controlled data flow architecture for all self-mapped media
- Pipelined hardware support for access to non-self-mapped media
- Order number with "i" denotes the version that supports the industrial temperature range of -40°C to 85°C

#### Hardware Features

- Single chip flash media controller with non-multiplexed interface for independent card sockets
- Flash Media Specification Revision Compliance
  - CompactFlash 4.1
  - Secure Digital 2.0
  - MultiMediaCard 4.2
- SDIO and MMC Streaming Mode support
  - Memory Stick 1.43
  - Memory Stick Pro Format 1.02
  - Memory Stick Duo Format 1.10
  - Memory Stick Pro-HG Duo Format 1.01
  - xD-Picture Card 1.2
  - SmartMedia 1.3
- Extended configuration options
  - xD player mode operation
  - Socket switch polarities, etc.
- Media Activity LED

- GPIO configuration and polarity
  - Up to 11 GPIOs (based on configuration) for special function use
  - Four GPIO's with up to 200 mA drive
- 16 additional GPIO's are available if CF is not used
- On board 24 MHz crystal driver circuit
- Optional external 24 MHz clock input
- 4 Independent internal card power FETs
  - 200 mA each
  - "Fold-back" short circuit protection
- 8051 8-bit microprocessor
  - 60 MHz - single cycle execution
  - 64 KB ROM | 14 KB RAM
- Internal regulator for 1.8 V core operation
- Optimized pinout improves signal routing which eases implementation for improved signal integrity

#### OEM Selectable Features

- Vendor, product, and language IDs
- Manufacturer ID and product strings (28 character)
- Serial number string (12h digit max)
- Customizable vendor specific data by optional use of external serial EEPROM
- Bus- or self-powered selection
- LED blink interval or duration
- Internal power FET configuration

#### Software Features

- Optimized for low latency interrupt handling
- Reduced memory footprint
- Device Firmware Upgrade (DFU) support of external EEPROM or External Flash
  - Assembly line support
  - End user field upgrade support
  - DFU Package consists of driver, firmware, sample DFU application and source code, DFU driver API
- Optional custom firmware with up to 128 KB external ROM

#### Applications

- Flash Media Card Reader/Writer
- Printers
- Desktop and Mobile PCs
- Consumer A/V
- Media Players/Viewers
- Vista ReadyBoost<sup>™</sup>

1.) xD-Picture Card not applicable to USB2251.

**ORDER NUMBER(S):**

Part Number	CompactFlash <sup>®</sup> Memory Stick <sup>®</sup> Secure Digital MultiMediaCard <sup>™</sup> SmartMedia <sup>™</sup>	xD-Picture Card <sup>™</sup>	Operational temperature
USB2250-NU-XX	✓	✓	0°C to 70°C
USB2250i-NU-XX	✓	✓	-40°C to 85°C
USB2251-NU-XX	✓		0°C to 70°C
USB2251i-NU-XX	✓		-40°C to 85°C

128-Pin VTQFP Lead-Free RoHS Compliant Package

**“XX” in the order number indicates the internal ROM firmware revision level.**
**Please contact your SMSC sales representative for more information.**


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SMSC makes the following part-numbered device available for purchase only by customers who are xD-Picture Card licensees: USB2250/USB2250i.

By purchasing or ordering any of such devices, Buyer represents, warrants, and agrees that Buyer is a duly licensed Licensee under an xD-Picture Card<sup>™</sup> License Agreement with Fuji Photo Film Co., Ltd., Olympus Optical Co., Ltd., and Toshiba Corporation; and that Buyer will maintain in effect such xD-Picture Card license and will give SMSC reasonable advance notice of any termination or expiration of such xD-Picture Card license, but in no event less than five days advance notice. SMSC may discontinue making such devices available for purchase by Buyer and/or discontinue further deliveries of such devices if such xD-Picture Card license shall expire, terminate, or cease to be in force, or if Buyer is or becomes in default of such xD-Picture Card license.

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## Chapter 1 Block Diagram

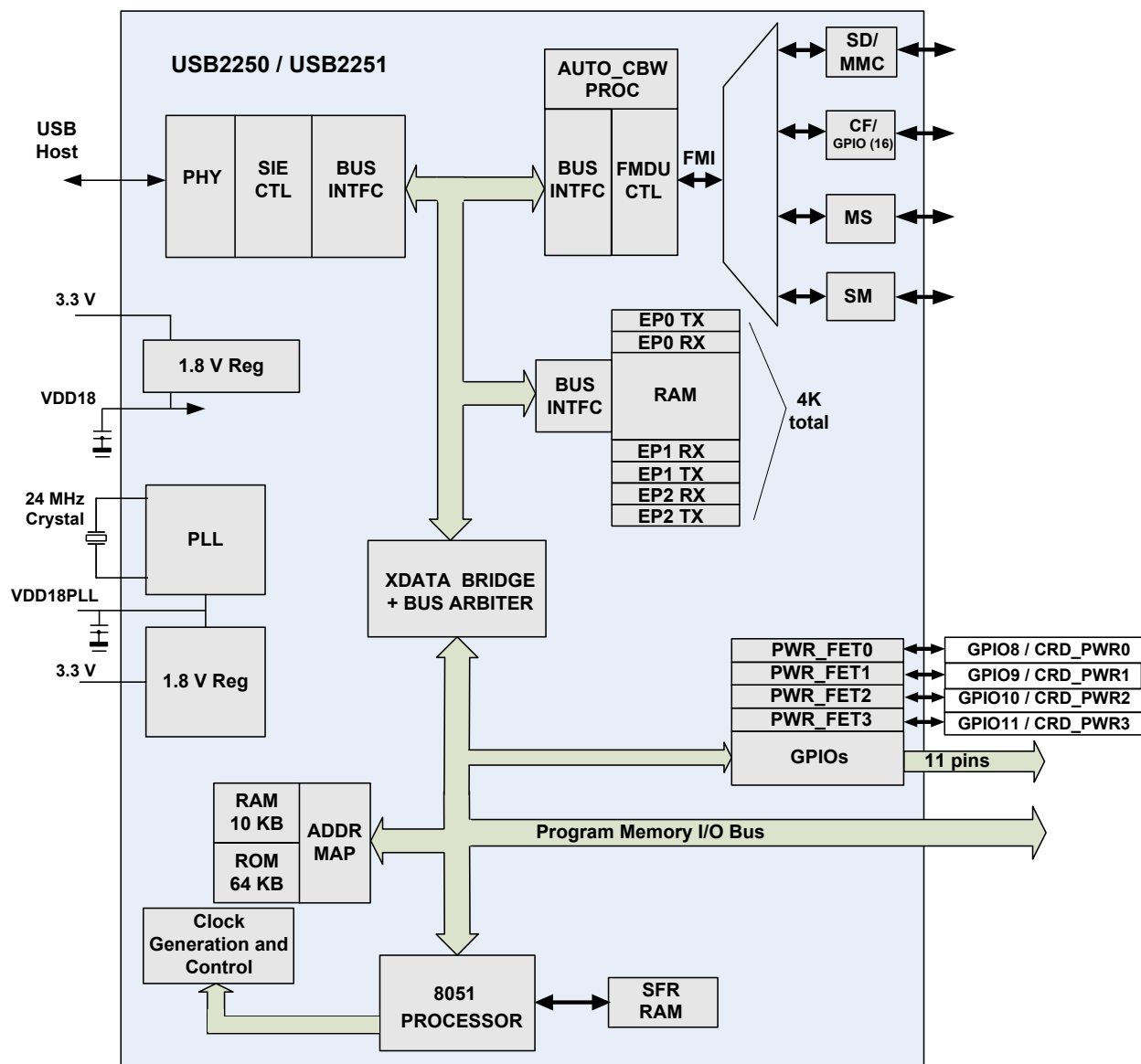


Figure 2 USB2250/50i/51i/51i Block Diagram

# Chapter 3 Package Outline

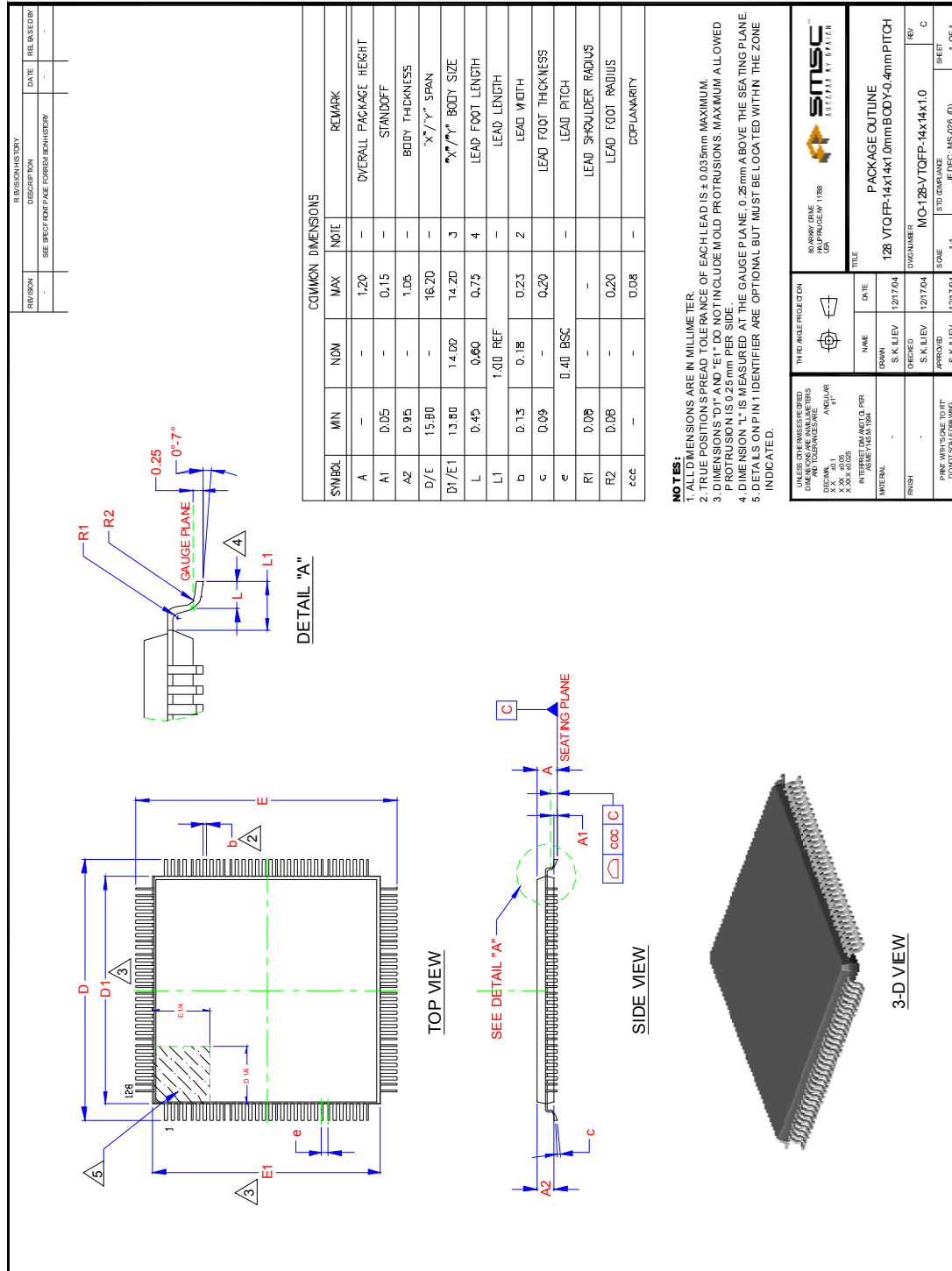


Figure 4 128-Pin VTQFP, 14x14x1.0 mm Body, 2.0 mm Pitch