Industrial Grade
Secure Digital Cards

W7SDxxxx1XA-H60Px Series

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Revision History

Revision	Month	Year	History
1.0	January	2009	-Preliminary Release
1.1	February	2010	-Updated Ordering Guide

WINTEC INDUSTRIES

Secure Digital Card

W7SDxxxx1XA-H60Px ROHS Compliant

Features

GENERAL
- Density up to 8GB
- 32-bit RISC/DSP Controller
- Solid State Data Storage
- Dual 3.3V / 1.8V Interface
- Industry Standard Compatibility
- ROHS Compliant

PERFORMANCE
- High Performance 24 MB/s (Sustained Read)
- High Performance 23 MB/s (Sustained Write)
- Dual Channel operation
- Low Power Consumption

Wintec Secure Digital Card

RELIABILITY
- > 2,000,000 Program/Erase Cycles
- Industrial Wear Leveling
  - Includes Static Block Management
- Spares & Bad Block Management
- On-chip ECC and CRC16 unit for flash data protection
- Hardware support for CPRM

COMPATIBILITY
- SD standard, rev. 1.01 /1.10 / 2.0

Description

The Wintec Industries W7SDxxxxx1XA-H60Px series of ROHS Compliant Secure Digital Cards are constructed with Samsung NAND-type single-level-cell (SLC) flash memory devices paired to a powerful 32-bit RISC/DSP-based system controller for virtual-to-physical address mapping and other flash management functions.

Wintec Secure Digital Cards employ a variety of sophisticated error checking and flash management utilities allowing for maximum levels of data reliability and card endurance. Patented wear-leveling methods ensure even wear of flash blocks across the entire card capacity. Background operations track erase counts, prioritize new writes to blocks with lower wear, and relocate static data to blocks with higher wear. Bad-block Management routines replace worn

blocks with spare blocks reserved by the controller on card initialization. Reed-Solomon based ECC algorithms capable of correcting 4 bytes in a 512 byte sector are implemented on the fly without performance degradation to ensure data reliability through user data transfers and background wear-leveling operations. Additional information regarding the specifics of wear leveling, ECC methods, and application-specific card life calculations are available upon request and under NDA.

1.0 General Product Specification

For all the following specifications, values are defined at ambient temperature and nominal supply voltage unless otherwise stated.

Table 1: Performance Specifications

Parameter		Spec
Burst Transfer Rate To/From Host: Read		24 MB/s
Write		23 MB/s
Burst Transfer Rate To/From Flash		40.0 MB/s per channel
Active-to-Sleep Delay after processing the last command		0 s
Startup Times	**Sleep-to-Write (Max.)**	No Delay
	Sleep-to-Read (Max.)	No Delay
	Reset-to-Ready (Typical)	100.0 ms
	Reset-to-Ready (Max.)	500.0 ms

Table 2: Card Endurance

Parameter	Spec
Program/Erase Cycles	> 2,000,000 Cycles
Read Cycles	Unlimited
Data Retention	10 Years (Min.)

Table 3: Card Data Reliability

Parameter	Spec
Non-Recoverable Errors	< 1 in 10^{20} Bytes Read
Erroneous Correction	< 1 in 10^{20} Bytes Read
ECC Correctability	4 Random Bytes/Sector

Table 4: Environmental Specifications

Parameters	Operating	Non-Operating
Temperature (Commercial Temp)	0°C to 70°C	-40°C to 125°C
Temperature (Extended Temp)	-25°C to 85°C	-40°C to 125°C
Relative Humidity	25% to 95% (Non-Condensing)	40% to 93% (Non-Condensing)
Vibration	15 G rms	15 G rms
Altitude	80,000 ft. (Max.)	N/A
Shock	1,000 G (Max.)	1,000 G (Max.)
Acoustic	0 db	N/A

NOTE:

1. Input voltage 3.3V (±5%) or 1.8V (±10%) with a maximum ripple of 100mV peak-to-peak.

2. All values listed are at 25°C and nominal supply voltage.

3. Stated figures are based on primary configurations and may vary as larger density component NAND flashes are released.
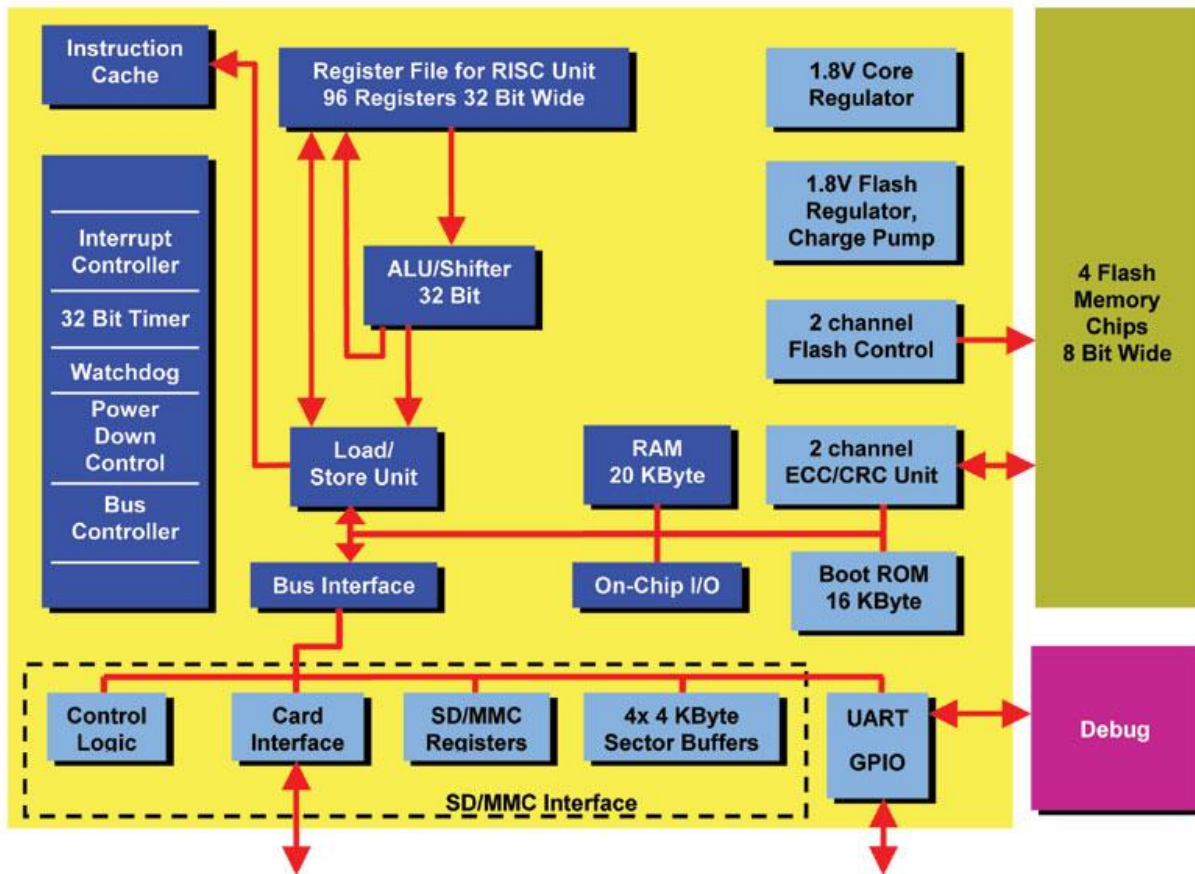
2.0 Architecture

Figure 1: Card Block Diagram

Table 5: Card Pin Assignment

PIN NO	NAME	TYPE	DESCRIPTION
1	CD/DAT	I/O/PP3	Card Detect/Data Line [Bit3]
2	CMD	PP	Command / Response
3	VSS1	S	Supply voltage ground
4	VDD	S	Supply voltage
5	CLK	I	Clock
6	VSS2	S	Supply voltage ground
7	DAT0	I/O/PP	Data Line [Bit0]
8	DAT1	I/O/PP	Data Line [Bit1]
9	DAT2	I/O/PP	Data Line [Bit2]

1) S : power supply ; I : input ; O : output ; PP : push-pull ; OD : open-drain NC : Not connected (or logical high)
2) The DAT line for read - when card is in output mode only

3.0 Ordering Information

Table 6: Product Availability List & Naming

Card Capacity	Part Number
128 MB	W7SD128M1XA(I)-H60PC-002.01
256 MB	W7SD256M1XA(I)-H60PB-002.01
512 MB	W7SD512M1XA(I)-H60PB-002.01
1 GB	W7SD001G1XA(I)-H60PB-002.01
2 GB	W7SD002G1XA(I)-H60PB-02D.01
4 GB	W7SD004GHXA(I)-H60PB-2Q2.01
8 GB	W7SD008GHXA(I)-H60PB-2Q2.01

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About Wintec Industries, Inc.

Wintec, founded in 1988, is headquartered in Milpitas, California. Wintec, a leading third party memory module manufacturer, specializes in a variety of module design and manufacturing, such as memory module, flash module, Handspring module, modem module, game module, etc. Besides a complete line of DDR, SDR, and EDO/FPM legacy memory modules, Wintec also distribute CPU, motherboard, peripherals, PC software, and consumer Flash products (such as MMC, SD, SMC, CompactFlash, PC Card, etc.). With excellent design engineering and manufacturing capability, Wintec provides a wide range of design and manufacturing services for our valuable customers from concept design to final product delivery. Wintec is ISO9001-2000 certified.

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