

# Hercules Series

Industrial Secure Digital (SD) Memory Card

Industrial Secure Digital High Capacity (SDHC) Memory Card

A PRO of Industrial Flash Memory Storage

www.apro-tw.com



APRO Co., Ltd.

Preliminary spec. sheet (091103-V1.0)



INDUSTRIAL CompactFlash Card

INDUSTRIAL PCMCIA ATA Card

INDUSTRIAL micro IDE Flash Disk

INDUSTRIAL Solid State Disk

INDUSTRIAL micro SATA Flash Disk

INDUSTRIAL Rugged USB Disk

Compatibility :



Supported O.S. :



Certification :



### Operating temperature supports

Industrial grade -40°C ~ 85°C

#### Features:

- NAND type SLC flash technology
- Fully compatible to the SDA Specification 2.00 and backboards compliant to SDA1.01/SDA1.1
- Supports industrial grade operating temperature -40°C ~ 85°C
- SD card capacity from 128MB to 2GB and SDHC from 4GB up to 8GB
- Supports SD mode and SPI mode
- Write Protect feature using mechanical switch
- Fixed BOM and 100% QC and functionality testing before delivery



INDUSTRIAL CompactFlash Card

INDUSTRIAL PCMCIA ATA Card

#### Specifications:

##### ◆ Compatibility

SD Memory Card Specifications, Part 1, Physical Layer Specification, version 2.0

SD Memory Card Specifications, Part 2, File System Specification, Version 2.00

SD Memory Card Specifications, Part 3, Security Specification, Version 2.00

Compatible with Multimedia Card, System Specification, Version 4.2

##### ◆ SD Specification Ver. 1.01

- Capacity supports from 128MB up to 2GB
- 9-pin contact pad
- 2.7 to 3.6V
- FAT file system

##### ◆ SDHC Specification Ver. 2.00

- Capacity supports from 4GB up to 8GB
- 9-pin contact pad
- 2.7 to 3.6V
- FAT32 file system

##### ◆ Flash technology

SLC-NAND type flash based

##### ◆ Form-factor

Standard SD Memory Card form-factor

##### ◆ Host Interface

9-pin connector

##### ◆ Write Protection

Write protect feature using mechanical switch

##### ◆ Performance

	SD Card	SDHC Card
• Sequential read	18.12 MB/sec	18.15 MB/sec
• Sequential write	10.33 MB/sec	14.23 MB/sec
• Average access time	0.82ms	0.87ms

##### ◆ Class Speed Rating

SDHC memory cards Class 6

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## ◆ Environmental specification

- **Operating temperature** Industrial grade -40°C ~ +85°C
- **Non-operating temperature** Industrial grade -65°C ~ +100°C
- **Humidity** 8% ~ 95% non-condensing
- **ESD Protection**
  - **Contact Pads:** ±4kV, Human body model according to ANSI EOS/ESD-S5.1-1998
  - **Non Contact Pads Area:** ±8kV (coupling plane discharge)  
±15kV (air charge), Human body model per IEC61000-4-2
- **Vibration** 15G peak-to-peak
- **Shock** 1,000G Max.
- **Altitude** 80,000 feet

## ◆ Power consumption

- **Power requirement** 2.7V ~ 3.6V
- **Reading mode** 55mA(Max.)
- **Writing mode** 60mA(Max.)
- **Standby mode** 38mA (Type.)

## ◆ Reliability & Durability

- **Durability** 10,000 inserting cycles
- **Bending** 10N
- **Torque** 0.15N, ± 2.5 deg.
- **Drop Test** 1.5M free fall
- **WP Switch Cycle** 1,000 cycles @ slide force 0.4N to 5N
- **Wear-leveling** Global wear-leveling algorithms
- **MTBF** > 2,000,000 hours
- **ECC** Hardware BCH ECC engine, 8 bit/sector (528 bytes)
- **Endurance** > 2,000,000 cycles logically contributed by wear-leveling and advanced bad sector management algorithms
- **Data retention** 10 years

## ◆ Physical specification

- **Weight (max.)** 2.5g/ 0.09oz (Max.)
- **Dimension(W x L x H)** 32.0 x 24.0 x 2.1 (mm) / 1.26 x 0.95 x 0.08 (inch)

- ◆ **Warranty** 5 years

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## Operating temperature supports Industrial grade -40°C ~ 85°C

### Industrial Secure Digital (SD) Memory Card

Product Picture	Capacity	-40° C~ 85° C
	128MB	WPSDC128M-MDISI
	256MB	WPSDC256M-MDISI
	512MB	WPSDC512M-MDISI
	1GB	WPSDC001G-MDISI
	2GB	WPSDC002G-MDISI

INDUSTRIAL CompactFlash Card

INDUSTRIAL PCMCIA ATA Card

### Industrial Secure Digital High Capacity (SDHC) Memory Card

Product Picture	Capacity	-40° C~ 85° C
	4GB	WPSDH004G-MDISI
	8GB	WPSDH008G-MDISI

INDUSTRIAL micro IDE Flash Disk

## Part number decoder :

**X1 X2 X3 X4 X5 X6 X7 X8 X9** – **X11 X12 X13 X14 X15**

**X1** : Grade

W : Industrial grade – operating temp. -40° C ~ 85° C

**X2** : The material of case

P : Plastic casing

**X3 X4 X5** : Product category

SDC : Secure Digital (SD) memory card

SDH : Secure Digital High Capacity (SDHC) memory card

**X6 X7 X8 X9** : Capacity

<b>128M:</b> 128MB	<b>002G:</b> 2GB
<b>256M:</b> 256MB	<b>004G:</b> 4GB
<b>512M:</b> 512MB	<b>008G:</b> 8GB
<b>001G:</b> 1GB	

**X11** : Controller

M : SMI Controller

**X12** : Controller version

A, B, C.....

**X13** : Controller grade

I : Industrial grade

**X14** : Flash IC

S : Samsung SLC-NAND Flash IC

**X15** : Flash IC grade / Type

I : Industrial grade

INDUSTRIAL Solid State Disk

INDUSTRIAL micro SATA Flash Disk

INDUSTRIAL Rugged USB Disk