

# PHANES-F Series

MLC SD & SDXC Memory Card 3.0



## Product Feature

- MLC - NAND type flash technology
- Supports SD mode and SPI mode
- Supports UHS-1
- Fully compatible to the SDA Specifications Ver 3.0
- Supports CPRM
- RoHS & REACH compliant
- SD card capacities from 4GB to 64GB
- Supports wide temp. grade operating temp -40°C~+85°C

## Product Specification

### Compatibility

- SD Memory Card Specifications, Part 1 Physical Layer Specification, version 3.1 Final
- SD Memory Card Specifications, Part 3, Security Specification, Version 3.0 Final

### SDHC Spec. Ver. 2.0

- Capacity supports from 4GB to 128GB, 9-pin contact pad, FAT32 file system Class 10

### Flash technology

- MLC-NAND type flash based

### Form-factor

- Standard SD card form-factor

### Host Interface

- 9-pin connector

### Write Protection

- Mechanical switch

### Performance

- Class-10

### Sequential read

- 88.7 MB/sec

### Sequential write

- 41.6 MB/sec

### Random access time

- 1ms (estimated)

### Environmental specification

#### Operating temp.

- Wide Temp. -40°C~+85°C

#### Non-operating temp.

- Wide Temp. -50°C~+95°C

#### Humidity

- 10% ~ 95% non-condensing

#### Vibration

- 20 Hz to 2K Hz, 20G, 3 axes

#### Shock

- 0.5ms, 1500G, 3 axes

#### Altitude

- 70,000 feet

### Power consumption

- Power requirement ➤ +3.3V ± 10%
- Reading mode ➤ 400 mA (Max.)
- Writing mode ➤ 400 mA (Max.)
- Standby mode ➤ 1000 uA (Max.)

### Reliability

- Wear-leveling ➤ Static and Dynamic wear-leveling algorithms
- ECC ➤ BCH ECC

### Physical specification


- Weight ➤ 2.5 g / 0.09 oz. (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

- MLC(standard/wide temp.) ➤ 2 years / Within 3k Erasing counts

## Operating temperature supports industrial grade temperature $-40^{\circ}\text{C} \sim +85^{\circ}\text{C}$

Part number list - MLC SD Memory Card

Product Picture	Capacity	$-40^{\circ}\text{C} \sim +85^{\circ}\text{C}$
	<b>4GB</b>	WPSDH004G-PFITMB
	<b>8GB</b>	WPSDH008G-PFITMB
	<b>16GB</b>	WPSDH016G-PFITMB
	<b>32GB</b>	WPSDH032G-PFITMB
	<b>64GB</b>	WPSDX064G-PFITMB

### PART NUMBER DECODER

X1 X2 X3 X4 X5 X6 X7 X8 X9 — X11 X12 X13 X14 X15 X16

Example

W P S D X 0 6 4 G — P F I T M B

#### X1 Grade

W : Wide temp grade operating temp.  $-40^{\circ}\text{C} \sim +85^{\circ}\text{C}$

#### X2 The material of casing

P : Plastic casing

#### X3 X4 X5 Product category

**SDH** : Secure Digital High Capacity (SDHC) memory card

**SDX** : Secure Digital High Capacity (SDHC) memory card

#### X6 X7 X8 X9 Capacity

**004G** : 4GB    **032G** : 32GB

**008G** : 8GB    **064G** : 64GB

**016G** : 16GB

#### X11 Controller

P : PHANES Series

#### X12 Controller version

A, B, C, D,....

#### X13 Controller grade

C : Commercial grade

#### X14 Flash IC

T : Toshiba flash IC

#### X15 Flash IC grade

M : MLC-NAND Flash

#### X16 Generation

B : 15 nm