



CERVOZ

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# Cervoz Industrial SSD

2.5" PATA

Momentum Series (MLC)

M120 Family

*Product Datasheet*





## Revision History

| Date       | Revision | Description  |
|------------|----------|--|
| 2015.01.05 | 1.0      | First Released   |
| 2015.04.13 | 1.1      | TeraByte Written (TBW) Information Added   |
| 2016.01.30 | 2.0      | New Manufacturing Process for NAND Flash IC<br>1.3 Ordering Information Changed<br>2.1 Power Consumption Updated<br>4.1 Part No. Decoder Updated |



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## 1. Product Overview

### 1.1 Introduction

Cervoz Industrial 2.5" PATA SSD M120 is a high capacity Solid State Disk product that is in compliance with the 2.5" form factor and PATA standards. This is a perfect replacement for traditional PATA hard disk drives with much lower power consumption.

M120 uses superior quality preselected multi-level cell (MLC) NAND flash memory from the industry leading manufacturer Toshiba. This product includes both standard temperature range and wide temperature range options with various capacities to choose from.

M120 offers outstanding performance and reliability; the product family is a perfect solution for price sensitive semi-industrial and general industrial applications.

### 1.2 Feature

- Compliant with ATA command set
- MLC NAND flash memory
- Capacity: 16GB ~ 256GB
- Operating as boot disk
- Product includes Standard Temperature range & Wide Temperature range
- Static and dynamic wear leveling
- Bad block management
- S.M.A.R.T.

### 1.3 Product Appearance & Models

Cervoz Industrial 2.5" PATA SSD M120



| M120 Family<br>Standard Temp. (0°C ~ 70°C)<br>Model No. | M120 Family<br>Wide Temp. (-40°C ~ 85°C)<br>Model No. | Capacity |
|---|---|----------|
| CIS-2PM120THC016GS                                      | CIS-2PM120THC016GW                                    | 16GB     |
| CIS-2PM120THC032GS                                      | CIS-2PM120THC032GW                                    | 32GB     |
| CIS-2PM120TIC064GS                                      | CIS-2PM120TIC064GW                                    | 64GB     |
| CIS-2PM120TJC128GS                                      | CIS-2PM120TJC128GW                                    | 128GB    |
| CIS-2PM120TJC256GS                                      | CIS-2PM120TJC256GW                                    | 256GB    |

**Please Note:**

Since certain storage capacity has to be reserved for firmware and controller management purposes; the physical capacity of the PATA flash module will be approximately 90% of the indicated capacity. If you need to install an image that has the exact (or close to) the indicated size of the flash module, please choose your flash module with a greater capacity.

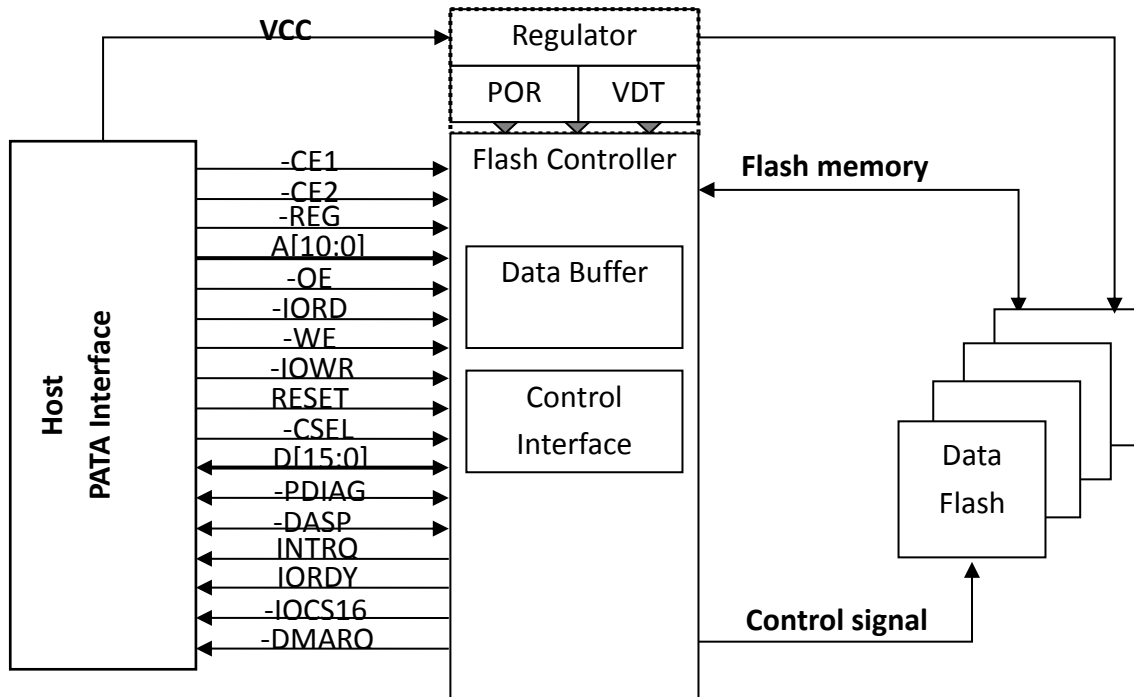
## 2. Product Specifications

### 2.1 General Specifications

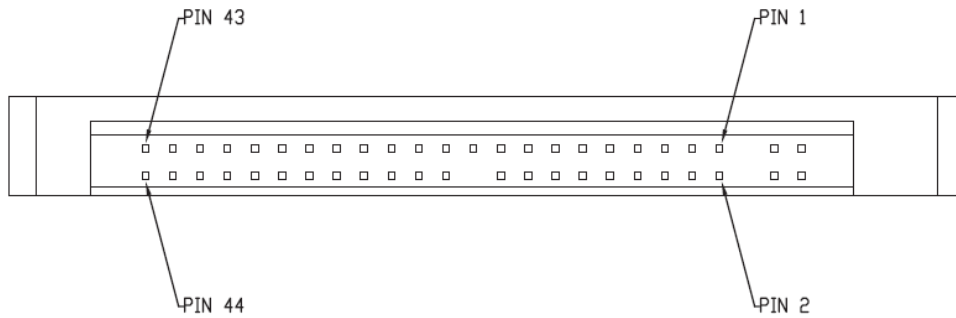
|                               |   |
|-------------------------------|---|
| <b>Form Factor</b>            | 2.5inch   |
| <b>Interface</b>              | PATA  |
| <b>Connector</b>              | PATA (44 pin)   |
| <b>NAND Flash Type</b>        | MLC   |
| <b>Capacity</b>               | 16GB/32GB/64GB/128GB/256GB  |
| <b>Sequential Read</b>        | up to 80MB/s  |
| <b>Sequential Write</b>       | up to 65MB/s  |
| <b>ECC Scheme</b>             | up to 68bits / 1K Byte  |
| <b>MTBF</b>                   | 2,000,000 hours   |
| <b>TeraByte Written (TBW)</b> | 16GB : 16<br>32GB : 31<br>64GB : 63<br>128GB : 125<br>256GB : 250 |
| <b>Supply Voltage</b>         | +5V DC +/-5% (3.3V and 5.0V)                                      |
| <b>Power Consumption</b>      | Active mode: < 800mW<br>Idle mode: < 20mW                         |
| <b>Dimension (LxWxH)</b>      | 100.00*69.85*7.20mm   |

## 2.2 Electronic Specifications

### 2.2.1 Block Diagram



## 2.2.2 Pin Assignment



| Pin No. | Pin Name              | Pin No. | Pin Name      |
|---------|-----------------------|---------|---------------|
| 01      | -RESET                | 02      | GND           |
| 03      | DD7                   | 04      | DD8           |
| 05      | DD6                   | 06      | DD9           |
| 07      | DD5                   | 08      | DD10          |
| 09      | DD4                   | 10      | DD11          |
| 11      | DD3                   | 12      | DD12          |
| 13      | DD2                   | 14      | DD13          |
| 15      | DD1                   | 16      | DD14          |
| 17      | DD0                   | 18      | DD15          |
| 19      | GND                   | 20      | KEY_PIN(OPEN) |
| 21      | DMARQ                 | 22      | GND           |
| 23      | -DIOW:STOP            | 24      | GND           |
| 25      | -DIOR:-HDMARDY:HSTOBE | 26      | GND           |
| 27      | IORDY:DDMARDY:DSTROBE | 28      | CSEL          |
| 29      | -DMACK                | 30      | GND           |
| 31      | INTRQ                 | 32      | IOIS16        |
| 33      | DA1                   | 34      | -PDIAG:-CBLID |
| 35      | DA0                   | 36      | DA2           |
| 37      | -CS0                  | 38      | -CS1          |
| 39      | -DASP                 | 40      | GND           |
| 41      | VCC                   | 42      | VCC           |
| 43      | GND                   | 44      | NC            |

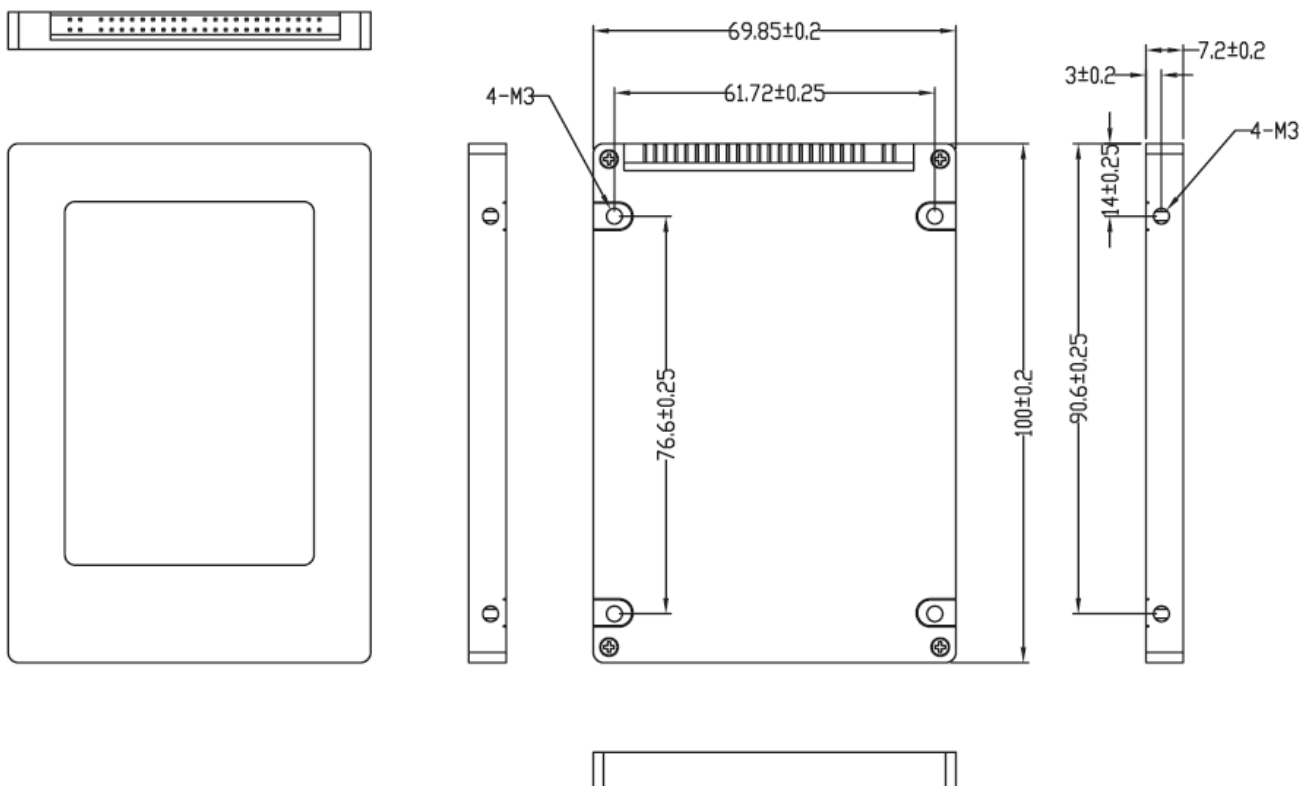


### 2.3 Environmental Specifications

| Type               |                                 | Value                  |
|--------------------|---------------------------------|------------------------|
| <b>Temperature</b> | Standard Temperature Operating: | 0°C~70°C               |
|                    | Standard Temperature Storage:   | -40°C~85°C             |
|                    | Wide Temperature Operating:     | -40°C~85°C             |
|                    | Wide Temperature Storage:       | -50°C~95°C             |
| <b>Humidity</b>    | Operating & Storage             | 10~95%, Non-Condensing |
| <b>Vibration</b>   | Operating                       | 20G, 10Hz~2000Hz       |
| <b>Shock</b>       | Operating                       | 1500G, 0.5ms           |

### 2.4 Mechanical Specifications

| Type        | Value              |
|-------------|--------------------|
| Form Factor | 2.5" PATA          |
| Length      | 100.00mm +/-0.20mm |
| Width       | 69.85mm +/-0.20mm  |
| Thickness   | 7.20mm +/-0.20mm   |



### 3. Supported Command

#### 3.1 List of Command Sets

| No. | Command Set                     | Code | FR | SC | SN | CY | DR | HD | LBA |
|-----|---------------------------------|------|----|----|----|----|----|----|-----|
| 1   | CFA Erase Sector(s)             | C0h  | -- | Y  | Y  | Y  | Y  | Y  | Y   |
| 2   | CFA Request Extended Error Code | 03h  | -- | -- | -- | -- | Y  | -- | --  |
| 3   | CFA Translate Sector            | 87h  | -- | Y  | Y  | Y  | Y  | Y  | Y   |
| 4   | CFA Write Multiple w/o Erase    | CDh  | -- | Y  | Y  | Y  | Y  | Y  | Y   |
| 5   | CFA Write Sector w/o Erase      | 38h  | -- | Y  | Y  | Y  | Y  | Y  | Y   |
| 6   | Check Power Mode                | E5h  | -- | -- | -- | -- | Y  | -- | --  |
| 7   | Execute Device Diagnostic       | 90h  | -- | -- | -- | -- | Y  | -- | --  |
| 8   | Identify Device                 | ECh  | -- | -- | -- | -- | Y  | -- | --  |
| 9   | Idle                            | E3h  | -- | Y  | -- | -- | Y  | -- | --  |
| 10  | Idle Immediate                  | E1h  | -- | -- | -- | -- | Y  | -- | --  |
| 11  | Initialize Device Parameters    | 91h  | -- | Y  | -- | -- | Y  | Y  | --  |
| 12  | NOP                             | 00h  | -- | -- | -- | -- | Y  | -- | --  |
| 13  | Read Buffer                     | E4h  | -- | -- | -- | -- | Y  | -- | --  |
| 14  | Read DMA                        | C8h  | -- | Y  | Y  | Y  | Y  | Y  | Y   |
| 15  | Read Multiple                   | C4h  | -- | Y  | Y  | Y  | Y  | Y  | Y   |
| 16  | Read Sector(s)                  | 20h  | -- | Y  | Y  | Y  | Y  | Y  | Y   |
| 17  | Read Verify Sector(s)           | 40h  | -- | Y  | Y  | Y  | Y  | Y  | Y   |
| 18  | Seek                            | 70   | -- | -- | Y  | Y  | Y  | Y  | Y   |
| 19  | Set Features                    | EFh  | Y  | -- | -- | -- | Y  | -- | --  |
| 20  | Set Multiple Mode               | C6h  | -- | Y  | -- | -- | Y  | -- | --  |
| 21  | Sleep                           | E6h  | -- | -- | -- | -- | Y  | -- | --  |
| 22  | Standby                         | E2h  | -- | -- | -- | -- | Y  | -- | --  |
| 23  | Standby Immediate               | E0h  | -- | -- | -- | -- | Y  | -- | --  |
| 24  | Write Buffer                    | E8h  | -- | -- | -- | -- | Y  | -- | --  |
| 25  | Write DMA                       | CAh  | -- | Y  | Y  | Y  | Y  | Y  | Y   |
| 26  | Write Multiple                  | C5h  | -- | Y  | Y  | Y  | Y  | Y  | Y   |
| 27  | Write Sector(s)                 | 30h  | -- | Y  | Y  | Y  | Y  | Y  | Y   |

**Note:**

FR: Feature Register

SC: Sector Count Register

SN: Sector Number Register

CY: Cylinder Low/High Register

DR: Drive bit of Drive/Head register

HD: Head No. of Drive/Head Register

LBA: LBA mode supported

Y: Set up

--: Not set up

#### 4. Part No. Decoder

##### 4.1 Part No. Decoder

| 1            | - | 2           | 3              | 4   | 5           | 6              | 7          | 8               | 9               |
|--------------|---|-------------|----------------|---|-------------|----------------|------------|-----------------|-----------------|
| Product Line | - | Form Factor | Product Series | Cervoz Family Code (Bus / Internal Control) | Flash Brand | Flash Capacity | Flash Mode | Module Capacity | Operating Temp. |
| XXX          | - | XX          | X              | XXX   | X           | X              | X          | XXXX            | X               |

##### 1. Product Line

|     |                                   |
|-----|-----------------------------------|
| CIS | Cervoz Industrial SSD             |
| CIM | Cervoz Industrial Memory Card     |
| CIE | Cervoz Industrial Embedded Module |

##### 2. Form Factor

|    |                                 |
|----|---------------------------------|
| 2S | 2.5" SATA                       |
| 2P | 2.5" PATA                       |
| CF | CompactFlash                    |
| CA | CFast                           |
| MS | mSATA                           |
| HM | Half Size mSATA                 |
| HS | Half Slim                       |
| M4 | M.2 2242                        |
| M6 | M.2 2260                        |
| M8 | M.2 2280                        |
| 0V | PATA Disk 40pin Vertical        |
| 4V | PATA Disk 44pin Vertical        |
| 4L | PATA Disk 44pin Horizontal Left |
| 7T | SATA Disk 7pin Vertical Tall    |
| 7L | SATA Disk 7pin Horizontal Left  |
| 7R | SATA Disk 7pin Horizontal Right |

##### 3. Product Series

|   |                          |
|---|--------------------------|
| S | Supreme Series (SLC)     |
| R | Reliance Series (RO-MLC) |
| M | Momentum Series (MLC)    |

##### 4. Cervoz Family Code

Bus and Internal Control for Cervoz Product Families

##### 5. Flash Brand

|   |         |
|---|---------|
| M | Micron  |
| T | Toshiba |

##### 6. Flash Capacity

|   |       |
|---|-------|
| A | 256Mb |
| B | 512Mb |

|   |       |
|---|-------|
| C | 1Gb   |
| D | 2Gb   |
| E | 4Gb   |
| F | 8Gb   |
| G | 16Gb  |
| H | 32Gb  |
| I | 64Gb  |
| J | 128Gb |
| K | 256Gb |
| L | 512Gb |
| M | 1Tb   |

### 7. Flash Mode

Internal Control for Flash Mode

### 8. Module Capacity

|      |       |
|------|-------|
| 128M | 128MB |
| 256M | 256MB |
| 512M | 512MB |
| 001G | 1GB   |
| 002G | 2GB   |
| 004G | 4GB   |
| 008G | 8GB   |
| 016G | 16GB  |
| 032G | 32GB  |
| 064G | 64GB  |
| 128G | 128GB |
| 256G | 256GB |
| 512G | 512GB |

### 9. Operating Temperature

|   |                                      |
|---|--------------------------------------|
| S | Standard Grade (0~ +70°C)            |
| W | Wide Temperature Grade (-40 ~ +85°C) |