

# Cervoz Industrial Embedded Module

mSATA

Momentum Series (MLC)

M330 Family

*Product Datasheet*





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## Revision History

Date	Revision	Description
2015.04.23	1.0	First Released



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## 1. Product Overview

### 1.1 Introduction

Cervoz Industrial mSATA Embedded Module M330 family is a Solid State Flash Disk product that is in compliance with the mSATA and SATA III standards. mSATA M330 family fits in any mSATA slots in a PC or mSATA sockets on a motherboard; it can be used for both booting and storage purposes.

M330 family uses superior quality preselected multi-level cell (MLC) NAND flash memory from the industry leading manufacturer Toshiba. This product includes various capacities to choose from.

M330 family 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 SATA III 6.0Gb/s
- MLC NAND flash memory
- Capacity: 4GB ~ 128GB
- With DDR3 DRAM Buffer
- Operating as boot disk
- Product includes Standard Temperature range
- Static and dynamic wear leveling
- Bad block management
- S.M.A.R.T & TRIM command

### 1.3 Product Appearance & Models

Cervoz Industrial mSATA Module M330



<b>M330 Family</b> <b>Standard Temp. (0°C ~ 70°C)</b> <b>Model No.</b>	<b>Capacity</b>
CIE-MSM330THT004GS	4GB
CIE-MSM330THT008GS	8GB
CIE-MSM330THT016GS	16GB
CIE-MSM330TIT032GS	32GB
CIE-MSM330TJT064GS	64GB
CIE-MSM330TKT128GS	128GB

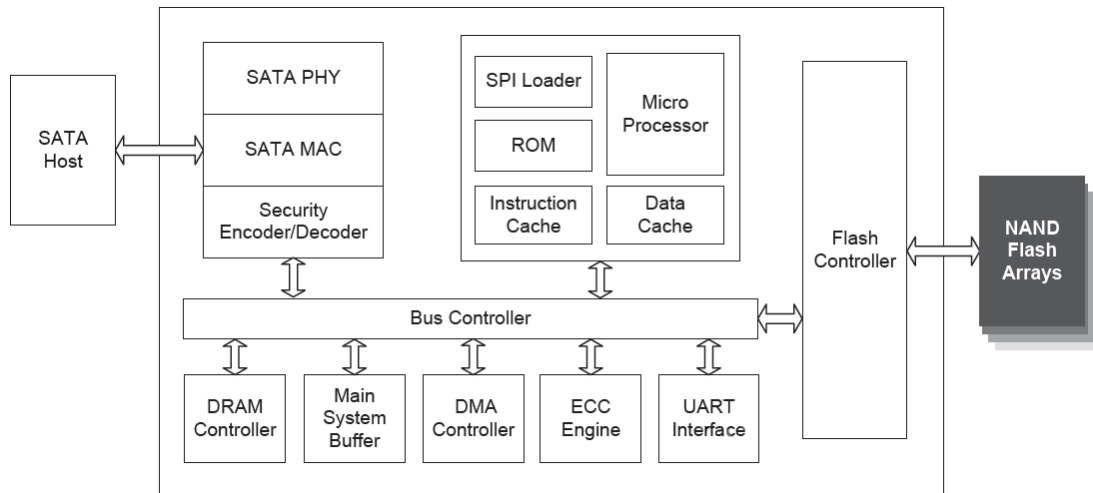
## 2. Product Specifications

### 2.1 General Specifications

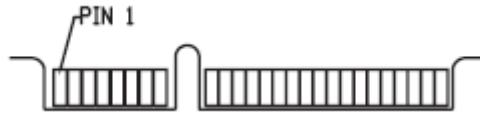
<b>Form Factor</b>	mSATA
<b>Interface</b>	SATA III 6.0Gb/s (backward compatible to 3.0Gb/s, 1.5Gb/s)
<b>Connector</b>	mSATA
<b>NAND Flash Type</b>	MLC
<b>Capacity</b>	4GB/8GB/16GB/32GB/64GB/128GB
<b>Sequential Read</b>	up to 535MB/s
<b>Sequential Write</b>	up to 175MB/s
<b>DDR3 DRAM Buffer</b>	Included
<b>ECC Scheme</b>	up to 66bits / 1K Byte
<b>MTBF</b>	2,000,000 hours
<b>TeraByte Written (TBW)</b>	4GB : 4 8GB : 8 16GB : 16 32GB : 31 64GB : 63 128GB : 125
<b>Low Power Management</b>	DEVSLP mode DIPM/HIPM mode
<b>Supply Voltage</b>	+3.3V DC +/-5%
<b>Power Consumption</b>	Active mode: < 2405mW Idle mode: < 395mW DEVSLP mode: < 5mW
<b>Dimension (LxWxH)</b>	50.95*30.00*3.90mm

## 2.2 Electronic Specifications

### 2.2.1 Block Diagram



## 2.2.2 Pin Assignment



Pin #	Pin Description	Signal Name	Pin #	Pin Description	Signal Name
1	Not Used	NC	27	Ground	GND
2	3.3V power in	+3.3V	28	Not Used	NC
3	Not Used	NC	29	Ground	GND
4	Ground	GND	30	Not Used	NC
5	Not Used	NC	31	SATA Rxn	-A – RX-
6	Not Used	NC	32	Not Used	NC
7	Not Used	NC	33	SATA Rxp	+A – RX-
8	Not Used	NC	34	Ground	GND
9	Ground	GND	35	Ground	GND
10	Not Used	NC	36	Not Used	NC
11	Not Used	NC	37	Ground	GND
12	Not Used	NC	38	Not Used	NC
13	Not Used	NC	39	3.3V power in	+3.3V
14	Not Used	NC	40	Ground	GND
15	Ground	GND	41	3.3V power in	+3.3V
16	Not Used	NC	42	Not Used	NC
17	Not Used	NC	43	Ground	GND
18	Ground	GND	44	Not Used	NC
19	Not Used	NC	45	Not Used	NC
20	Not Used	NC	46	Not Used	NC
21	Ground	GND	47	Not Used	NC
22	Not Used	NC	48	Not Used	NC
23	SATA Txp	+B - TX+	49	DA/DSS	DA/DSS
24	3.3V power in	+3.3V	50	Ground	GND
25	SATA Txn	-B - TX-	51	Presence Detection	Presence Detection
26	Ground	GND	52	3.3V power in	+3.3V

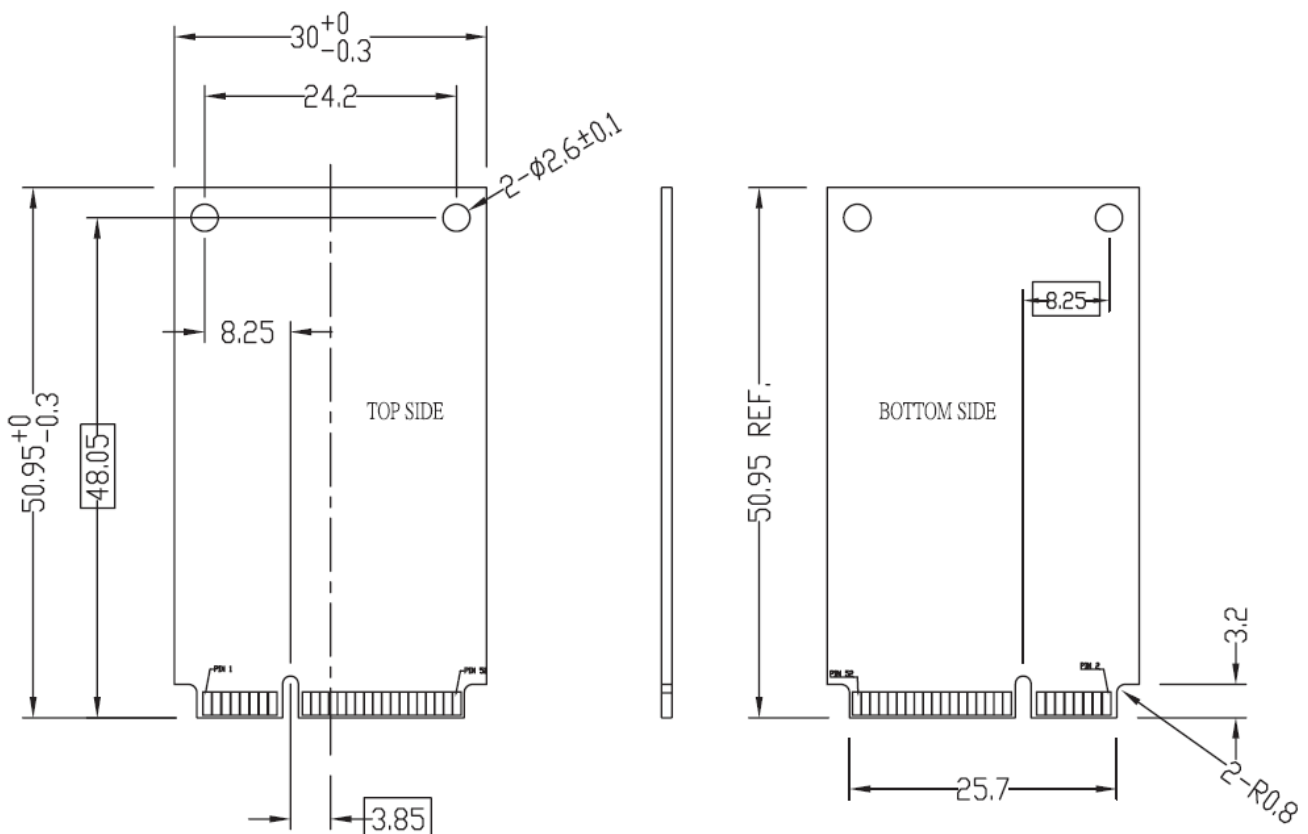


### 2.3 Environmental Specifications

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

### 2.4 Mechanical Specifications

Type	Value
Form Factor	mSATA
Length	50.95mm +/-0.30mm
Width	30.00mm +/-0.30mm
Thickness	3.90mm +/-0.30mm



### 3. Supported Command

#### 3.1 List of Command Sets

Code	Description	Code	Description
00h	NOP	C4h	Read Multiple
06h	Data Set Management	C5h	Write Multiple
20h	Read Sector(s)	C6h	Set Multiple Mode
24h	Read Sector(s) Ext	C8h	Read DMA
25h	Read DMA Ext	CAh	Write DMA
27h	Read Native Max Address Ext	E0h or 94h	Standby Immediate
29h	Read Multiple Ext	E1h or 95h	Idle Immediate
2Fh	Read Log Ext	E2h or 96h	Standby
30h	Write Sector(s)	E3h or 97h	Idle
34h	Write Sector(s) Ext	E4h	Read Buffer
35h	Write DMA Ext	E5h or 98h	Check Power Mode
37h	Set Max Address Ext	E6h or 99h	Sleep
39h	Write Multiple Ext	E7h	Flush Cache
40h or 41h	Read Verify Sector(s)	E8h	Write Buffer
42h	Read Verify Sector(s) Ext	EAh	Flush Cache Ext
60h	Read FPDMA Queued	ECh	Identify Device
61h	Write FPDMA Queued	EFh	Set Feature
70h	Seek	F1h	Security Set Password
90h	Execute Device Diagnostic	F2h	Security Unlock
91h	Initialize Drive Parameters	F3h	Security Erase Prepare
B0h	SMART Disable Operations	F4h	Security Erase Unit
B0h	SMART Enable/Disable Autosave	F5h	Security Freeze Lock
B0h	SMART Enable Operations	F6h	Security Disable Password
B0h	SMART Execute OFF-LINE Immediate	F8h	Read Native Max Address
B0h	SMART Read Log	F9h	Set Max Address
B0h	SMART Read Data	F9h	Set Max Set Password
B0h	SMART Read Threshold	F9h	Set Max Lock
B0h	SMART Return Status	F9h	Set Max Freeze Lock
B0h	SMART Save Attribute Values	F9h	Set Max Unlock
B0h	SMART Write Log		

#### 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	Die Package	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
HS	Half Slim
0V	PATA Disk 40pin Vertical
4V	PATA Disk 44pin Vertical
7T	SATA Disk 7pin Vertical Tall

##### 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. Die Package

T	TSOP
B	BGA

### 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)