

# ***innDisk USB EDC horizontal***

**USB EDC horizontal Datasheet Rev 1.7**

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## REVISION HISTORY

Revision	Description	Date
1.0	First Release	March 2007
1.1	Modify some information	April 2007
1.2	Remove vertical type I	November 2007
1.3	Correct pin assignment	March 2008
1.4	Modify some information	March 2008
1.5	Modify storage temperature	April 2008
1.6	Updated OS bootable support and clarify type (vertical and horizontal)	June 2008
1.7	Add power supply 3.3V and 1.8V	June 2008

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## 1. Introduction

The InnoDisk USB EDC (Embedded Disk Card) products provide high capacity USB flash memory storage that electrically complies with High-speed USB 2.0 interface & backward compatible with USB 1.1. With vertical and horizontal version for option, the device features attractive small form factor and the connectivity over USB2.0 and the NAND flash architecture provide a faster data transmission.

## 2. Features

The USB EDC products provide the following system features:

- Capacities:
  - Horizontal version: 256MB, 512MB, 1GB, 2GB, and 4GB
- High-speed USB 2.0 interface; backward compatible with USB 1.1
- Pin-pitch: 2.00mm and 2.54 mm
- High reliability based on the internal 4bit ECC (Error Correction Code) function
- Read & Write performance: (maximum speed)
  - Horizontal version
    - ◆ 1GB, 2GB, 4GB - Read: 32Mbytes/s, Write: 23Mbytes/s
    - ◆ 256MB, 512MB - Read: 19Mbytes/s, Write: 17Mbytes/s
- Static Wear-leveling supported
- Two NAND flash interleave supported (Horizontal version: 1GB, 2GB, 4GB)
- Low power consumption
  - Power supply: 5V, 3.3V, 1.8V
  - Read/Write
    - ◆ Horizontal version: 120mA
    - ◆ Vertical version: 105mA
  - Suspend: less than 500μA
- Embedded XP Evaluation, Build 2600.XPSP1. 020828-1920 (boot-up support)
- Fixed/Removable mode (for option, default is Fixed mode)
- Temperature range:
  - Operating: -10°C ~ +70°C
  - Storage: -55°C ~ +95°C

### 3. Pin Assignment

See Table 1 for USB EDC vertical type pin assignments.

**Table 1: USB EDC Vertical Type Pin Assignments**

<b>Horizontal Type</b>			
<b>Pin No.</b>	<b>Signal</b>	<b>Pin No.</b>	<b>Signal</b>
<b>1</b>	+5VDC	<b>2</b>	NC
<b>3</b>	USB Data(-)	<b>4</b>	NC
<b>5</b>	USB Data(+)	<b>6</b>	NC
<b>7</b>	GND	<b>8</b>	NC
<b>9</b>	NC	<b>10</b>	NC

### 4. Specifications

#### 4.1 CE and FCC Compatibility

The InnoDisk USB EDC conforms to CE requirements and FCC standards.

#### 4.2 RoHS Compliance

The InnoDisk USB EDC is fully compliant with RoHS directive.

## 5. Environmental Specifications

### 5.1 Temperature Ranges

Operating Temperature Range: -10°C to +70°C

Storage Temperature Range: -55°C to +95°C

### 5.2 Humidity

Relative Humidity: 10-95%, non-condensing.

### 5.3 Shock and Vibration

**Table 2: Shock/Vibration Testing for USB EDC**

Reliability	Test Conditions	Reference Standards
Vibration (Vertical version)	7 Hz to 2 KHz, 5 g, 3 axes, 30minutes	IEC 68-2-6
Mechanical Shock (Vertical version)	Duration: 10ms, 50 g, 3 axes, 15times	IEC 68-2-27
Vibration (Horizontal version)	10 Hz to 500 Hz, 5 g, 3 axes, 1hour	IEC 68-2-6
Mechanical Shock (Horizontal version)	Duration: 10ms, 50 g, 3 axes, 20times	IEC 68-2-27

### 5.4 Mean Time between Failures (MTBF)

Table 2 summarizes the MTBF prediction results for various USB EDC configurations. The analysis was performed using a RAM Commander™ failure rate prediction.

- Failure Rate:** The total number of failures within an item population, divided by the total number of life units expended by that population, during a particular measurement interval under stated condition.
- Mean Time between Failures (MTBF):** A basic measure of reliability for repairable items: The mean number of life units during which all parts of the item perform within their specified limits, during a particular measurement interval under stated conditions.



**Table 3: USB EDC MTBF**

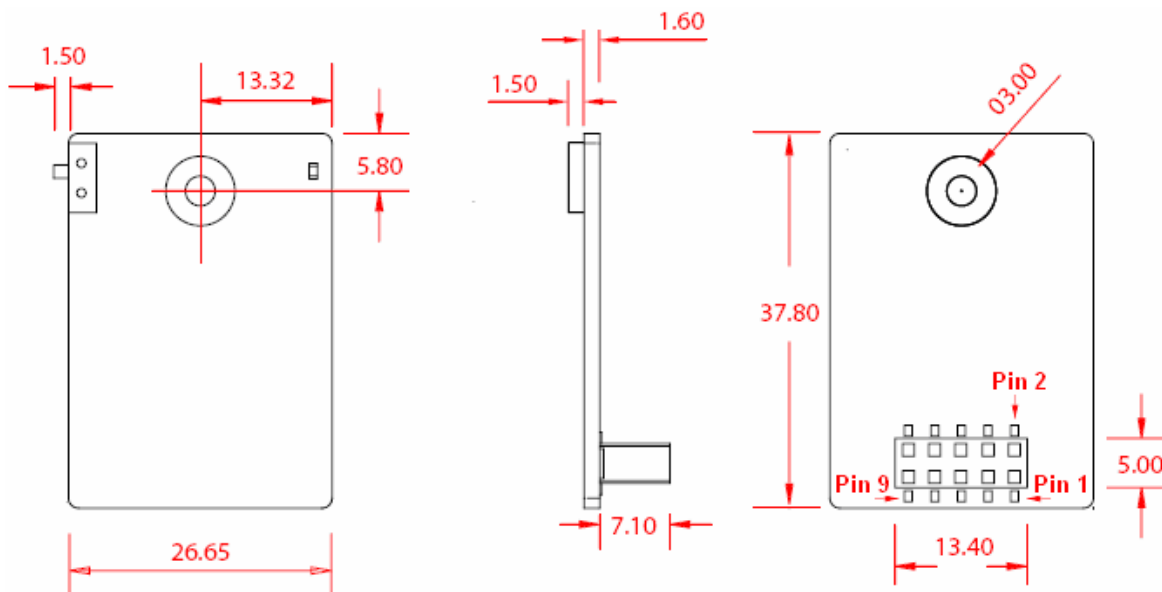
Product	Condition	MTBF (Hours)
Vertical II Version	Telcordia SR-332 GB, 25°C	> 3,000,000
Horizontal Version		> 3,000,000

**5.5 Mechanical Dimensions**

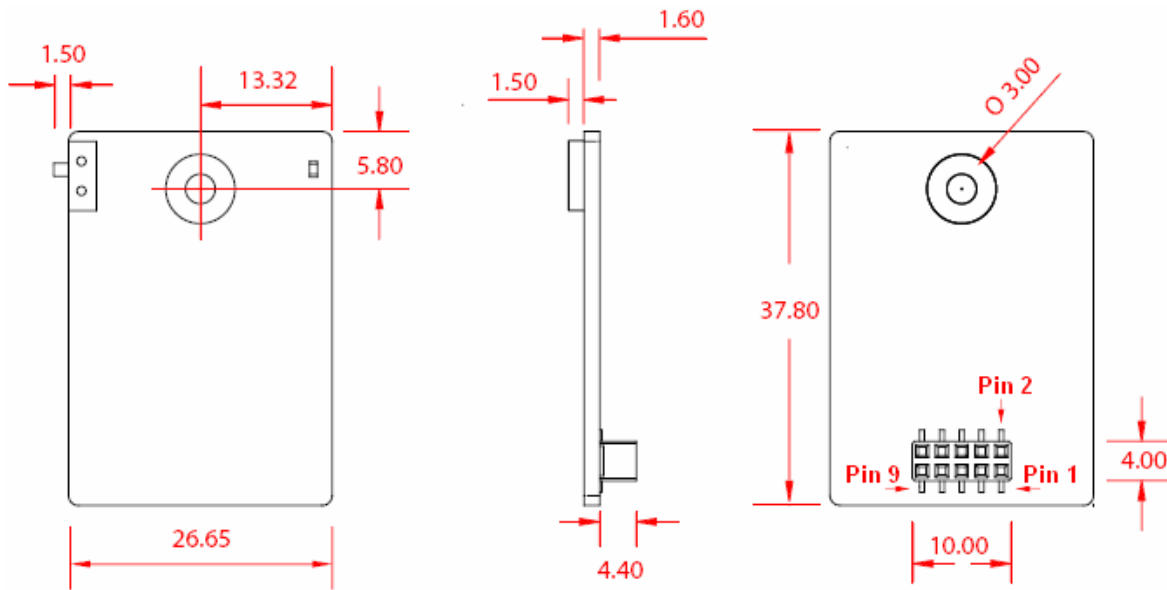
Horizontal Type: (2.54mm) 37.8/26.65/8.7 mm (L/W/H)

(2.00mm) 37.8/26.65/5.0 mm (L/W/H)

**Figure 1: Mechanical Dimension of USB EDC Horizontal Type (2.54mm)**



**Figure 2: Mechanical Dimension of USB EDC Horizontal Type (2.00mm)**



## 5.6 Electrical Specifications

### 5.6.1 Absolute Maximum Ratings

**Table 4: USB EDC Absolute Maximum Ratings**

Item	Symbol	Rating	Unit
Storage Temperature	T <sub>Storage</sub>	-55 ~ +95	°C
Ambient Operating Temperature	T <sub>a</sub>	-10 ~ +70	°C
3.3V supply voltage	VCC33	-0.3 ~ 3.6	V
1.8V supply voltage	VCC18	-0.3 ~ 2	V
3.3V buffer input voltage	V <sub>in33</sub>	-0.3 ~ 3.6	V
3.3V/5V buffer input voltage	V <sub>in335</sub>	-0.3 ~ 5	V
1.8V buffer input voltage	V <sub>in18</sub>	-0.3 ~ 2	V

### 5.6.2 Operating Conditions

**Table 5: USB EDC Operating Conditions**

Item	Symbol	Rating	Unit
USB 5V supply voltage	USBV <sub>in</sub>	3.2 ~ 5.5	V
3.3V supply voltage	VDD33	3.0 ~ 3.6	V
1.8V supply voltage	VDD18	1.6 ~ 2	V

### 5.6.3 DC Characteristic

**Table 6: USB EDC DC Characteristic**

Item	Symbol	Min	Max	Unit
TTL Input low voltage	VIL_TTL	-0.3	0.8	V
TTL Output high voltage	VOH_TTL	0.9 VCC33		V
TTL Output low voltage	VOL_TTL		0.4	V
TTL Output high current	IOH_TTL	-4		m
TTL Output low current	IOL_TTL		4	m
USB Input high voltage for low/full speed	VIH_USB	2.0		V
USB Input low voltage for low/full speed	VIL_USB		0.	V
Difference common mode input range for low/full speed	VI_USB_CM	0.8	2.	V
USB high speed squelch input detection threshold	VI_USB_HSSQ	0.1	0.1	V
USB high speed disconnect input detection threshold	VI_USB_HSDSC	0.525	0.625	V
USB high speed signaling common mode range	VI_USB_HSCM	-0.05	0.	V
USB output high voltage for low/full speed	VOH_USB	2.8	3.	V
USB output low voltage for low/full speed	VOL_USB	0	0.	V
USB output high voltage for high speed	VOH_USB_HS	0.36	0.4	V
USB output low voltage for high speed	VOL_USB_HS	-0.01	0.0	V
USB output high current for low/full speed	IOH_USB	-10		m
USB output low current for low/full speed	IOL_USB		1	m
USB output high current for high speed	IOH_USB_HS	-40		m
USB output low current for high speed	IOL_USB_HS		4	m