

innODisk USB EDC vertical

USB EDC vertical 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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FIGURE 1: MECHANICAL DIMENSION OF USB EDC VERTICAL TYPE II9

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
 - Vertical version: 256MB, 512MB, 1GB, and 2GB
- High-speed USB 2.0 interface; backward compatible with USB 1.1
- 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
 - Vertical version
 - ◆ 256MB, 512MB, 1GB, 2GB - 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 pin assignments.

Table 1: USB EDC Vertical Type II Pin Assignments

Vertical Type II			
Pin No.	Signal	Pin No.	Signal
1	NC	2	+5VDC
3	NC	4	USB Data(-)
5	NC	6	USB Data(+)
7	NC	8	GND
9	KEY (Blocked)	10	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.

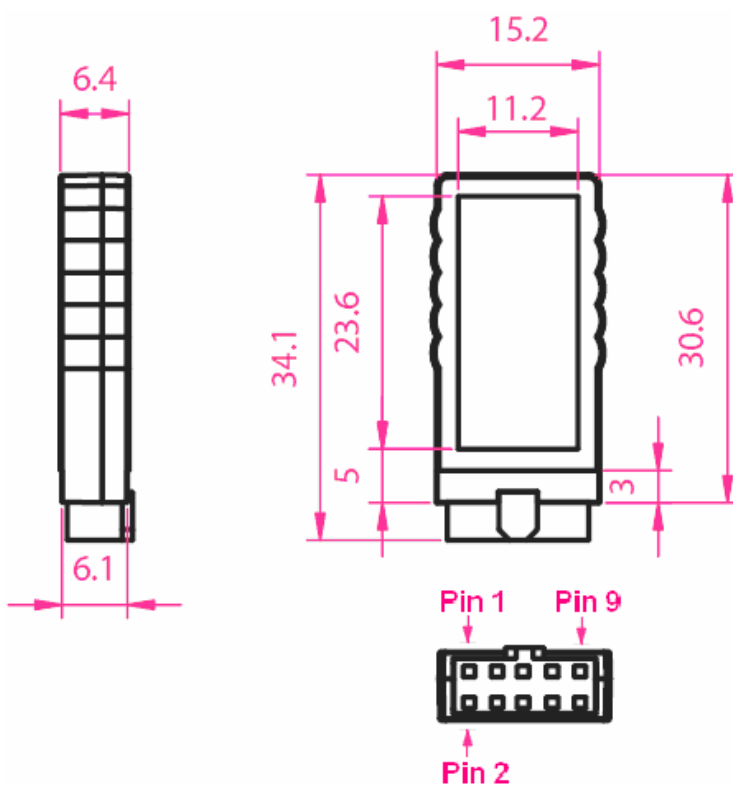
Table 3: USB EDC MTBF

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

Vertical Type II¹: 15.2/6.4/34.1 mm (W/T/H)

Figure 1: Mechanical Dimension of USB EDC Vertical Type II



¹ Type I has been phased out.

5.6 Electrical Specifications

5.6.1 Absolute Maximum Ratings

Table 4: USB EDC Absolute Maximum Ratings

Item	Symbol	Rating	Unit
Storage Temperature	T _{Storage}	-55 ~ +95	°C
Ambient Operating Temperature	T _a	-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 _{in33}	-0.3 ~ 3.6	V
3.3V/5V buffer input voltage	V _{in335}	-0.3 ~ 5	V
1.8V buffer input voltage	V _{in18}	-0.3 ~ 2	V

5.6.2 Operating Conditions

Table 5: USB EDC Operating Conditions

Item	Symbol	Rating	Unit
USB 5V supply voltage	USBV _{in}	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	V _{IL_TTL}	-0.3	0.8	V

TTL Output high voltage	V _{OH_TTL}	0.9 VCC33		V
TTL Output low voltage	V _{OL_TTL}		0.4	V
TTL Output high current	I _{OH_TTL}	-4		m
TTL Output low current	I _{OL_TTL}		4	m
USB Input high voltage for low/full speed	V _{IH_USB}	2.0		V
USB Input low voltage for low/full speed	V _{IL_USB}		0.	V
Difference common mode input range for low/full speed	V _{I_USB_CM}	0.8	2.	V
USB high speed squelch input detection threshold	V _{I_USB_HSSQ}	0.1	0.1	V
USB high speed disconnect input detection threshold	V _{I_USB_HSDSC}	0.525	0.625	V
USB high speed signaling common mode range	V _{I_USB_HSCM}	-0.05	0.	V
USB output high voltage for low/full speed	V _{OH_USB}	2.8	3.	V
USB output low voltage for low/full speed	V _{OL_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