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Virtium TuffDrive™ eUSB Key SSD

VTDU34P Product Specification

1.0 Introduction

Virtium TuffDrive™ eUSB SSDs are ideal solutions for server, networking, embedded and industrial applications that require a modest amount of storage and require a widely supported USB2.0 interface. Typical applications include operating system and file storage, system level diagnostics, or as a backup repository for data in DRAM in the event of a system-level power-down.

1.1 Features

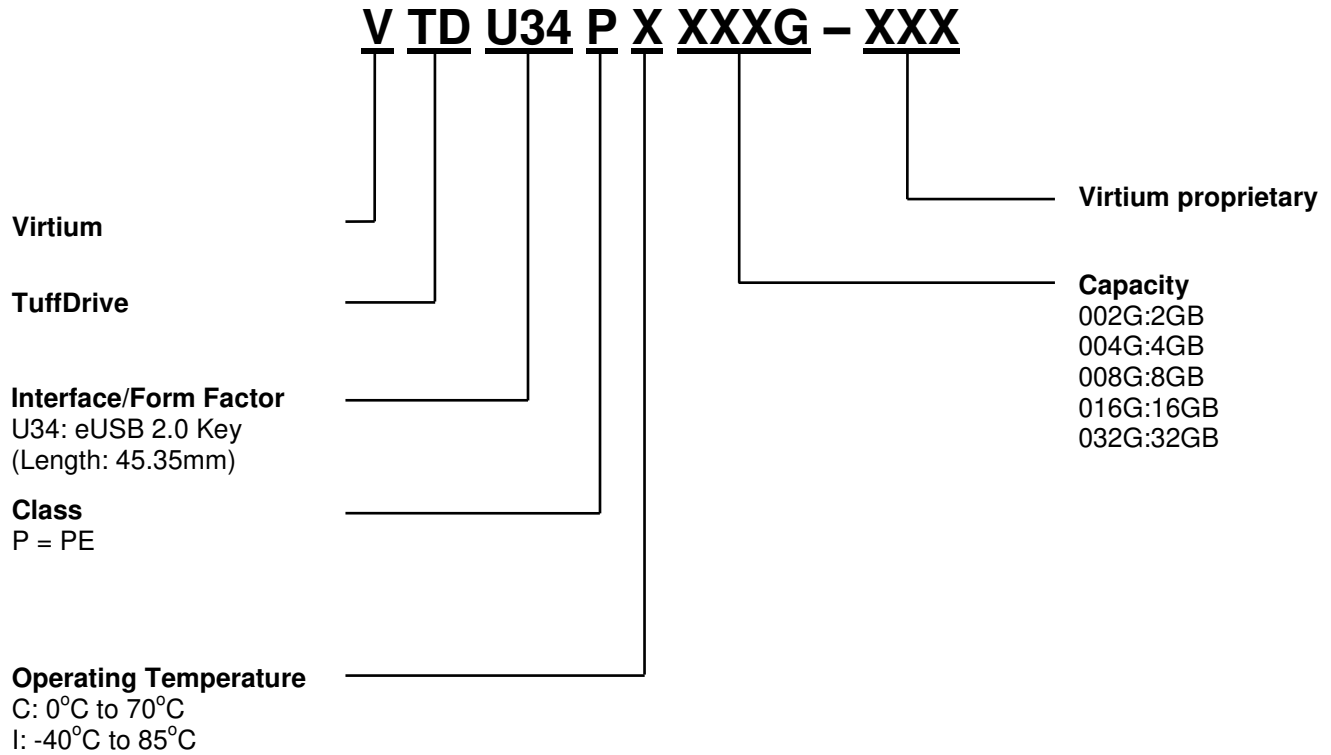
- Capacities: 2GB, 4GB, 8GB, 16GB, 32GB
- Industrial SLC
- Sustained Performance
 - Read: Up to 34MB/s
 - Write: Up to 21MB/s
- Temperature
 - Commercial operating: 0°C to 70°C
 - Industrial operating: -40°C to 85°C
 - Non-operating: -55°C to 95°C
- Power: 5V
 - Maximum: mW (5V)
 - Idle: 340 mW (5V)
- Reliability
 - MTBF: 5,000,000 hours
 - SLC NAND endurance 60K @ 55°C
- Compliance
 - USB 2.0
 - RoHS
 - CE and FCC
- Operating Systems supported: Windows 7, Vista, XP, 200, ME, 98/98SE, and Mac OS 9.x and above, Linux Kernel 2.4 and above
- Supports unique VID, PID, and serial number
- Form Factor Type – A connector
- Mechanical Dimensions - L x W x H mm (inches)
 - 45.35 (1.785) x 17.90 (0.705) x 6.20 (0.244)
- Weight
 - 5 +/- 0.1 g
- Environmental (Operating/non-operating):
 - MIL-STD-810F
 - Shock: 1500g, 0.5ms duration
 - Vibration: 16.4G_{RMS}





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| Product Specification | |
| TuffDrive eUSB Key SSD VTDU34PxxxxG-xxx | Rev: 0.8 |

2.0 Ordering Information and Part Numbering System





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4.0 Specifications

4.1 Capacity

Table 1: TuffDrive eUSB capacity

| Unformatted Capacity (GB) ⁽¹⁾ | User-Addressable LBA ⁽²⁾ | User-Addressable Capacity Bytes |
|--|-------------------------------------|---------------------------------|
| 2 | 3,907,670 | 2,000,727,040 |
| 4 | 7,815,339 | 4,001,453,568 |
| 8 | 15,630,678 | 8,002,907,136 |
| 16 | 31,261,356 | 16,005,814,272 |
| 32 | 62,522,712 | 32,011,628,544 |

(1) 1GB = 1,000,000,000 bytes

(2) LBA: Logical Block Address. Logical block size of 512 bytes (1 sector)

4.2 Performance

Table 2: Read/Write Performance⁽¹⁾

| Transfer Rate | Value | Units |
|------------------------------|-------|-------|
| Sustained Read (max) >= 8GB | 34 | MB/s |
| Sustained Write (max) >= 8GB | 21 | MB/s |
| Sustained Read (max) 4GB | 27 | MB/s |
| Sustained Write (max) 4GB | 16.5 | MB/s |
| Sustained Read (max) 2GB | 25 | MB/s |
| Sustained Write (max) 2GB | 16.5 | MB/s |

(1) CrystalDiskMark 3.0.3

4.3 Environmental Specifications

4.3.1 Temperature and Humidity

Table 3: Temperature and Humidity

| P/N | Operating Temperature (°C) | Non-Operating Temperature (°C) & Moisture Sensitivity |
|------------------|----------------------------|---|
| VTDU34PCxxxG-xxx | 0°C to 70°C | -65°C to +95°C 5% to 95% (non-condensing) |
| VTDU34PIxxxG-xxx | -40°C to 85°C | |

4.3.2 Shock and Vibration

Table 4: Shock and Vibration

| Reliability | Test Conditions |
|--------------------------|-------------------------------|
| Shock ⁽¹⁾ | 1500G, ½ sine, 0.5ms duration |
| Vibration ⁽²⁾ | 16.4G _{RMS} |

- (1) MIL-STD-810F, Method 516.5
- (2) MIL-STD-810F, Method 514.5

4.4 Mean Time Between Failures (MTBF)

Virtium’s TuffDrive eUSB achieves a MTBF of 5,000,000 hours predicted based on the component reliability data using Telcordia SR-332 methods at 40°C.

4.5 Power Requirements

5V single power supply operation.

Table 5: Power Consumption

| Voltage | Maximum ⁽¹⁾ | Typical ⁽²⁾ | Idle |
|---------|------------------------|------------------------|--------|
| 5V | 585 mW | 404 mW | 390 mW |

- (1) Max power consumption measured on > 8GB , 100% 64KB sequential writes
- (2) 70/30 read/write workload

4.6 S.M.A.R.T. Attributes

The following table defines the current Virtium SMART data attributes that are supported.

Customers may view this data using the Linux SMARTmontools package. This package and the associated **smartctl** command should be used with options **-a**, **-i**, and **-d sat** for best viewing. The command `$ smartctl -d sat -a -i /dev/sdb` was used to retrieve the data below.

| Attribute ID | Attribute Name | Attribute Description |
|--------------|-------------------|---|
| 0x0C | Power Cycle Count | Number of Power On cycles |
| 0xC4 | Spare block count | The amount of available spare blocks. Attribute value. The value returned here is the percentage of remaining spare blocks summed over all flash chips, i.e.(100 × current spare blocks / initial spare blocks) |
| 0xE5 | Erase count | The value returned here is an estimation of the remaining card life, in percent, based on the number of flash block |



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| Attribute ID | Attribute Name | Attribute Description |
|--------------|--------------------------------|---|
| | | erases compared to the target number of erase cycles per block. |
| 0xCB | ECC Error Count | Total number of ECC errors correctable and uncorrectable for the NAND data. |
| 0xCC | Number of corrected ECC errors | The total number of correctable ECC errors that have occurred on flash read commands. |
| 0xE8 | Number of Reads | The total number of flash read commands. |
| 0xF1 | Total LBAs Written | Total number of LBAs written to the disk, divided by 65536 |
| 0xF2 | Total LBAs Read | Total number of LBAs read from the disk, divided by 65536 |

4.7 Certifications and Compliance

Table 6: Certifications and Compliance

| Compliance/Certification | Description |
|--------------------------|--|
| CE and FCC Compliant | Class: FCC Part 15 Subpart B Class B:2011 Declaration of Conformity registration No. STE120607699 |
| RoHS Compliant | Restriction of Hazardous Substance Directive |
| UL Certified | Underwriters Laboratories, Inc. 94V-0 |
| WEEE Certified | Waste, Electrical and Electronic Equipment Directive |

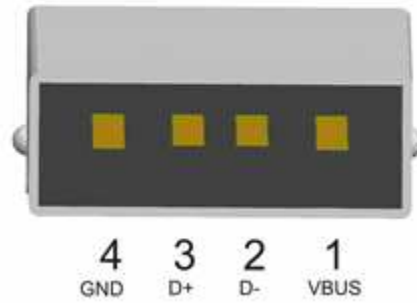
5.0 Physical Specification

5.1 Pin Assignments

Table 7: Pin Assignments

| Pins | Type | Description |
|------|------------|-----------------------|
| 1 | VBUS (+5V) | Input Power |
| 2 | D - | Differential Data (-) |
| 3 | D + | Differential Data (+) |
| 4 | GND | Ground |

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USB 2.0 pinout

Figure 1: The standard USB type-A plug pinout



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5.2 Mechanical Dimensions

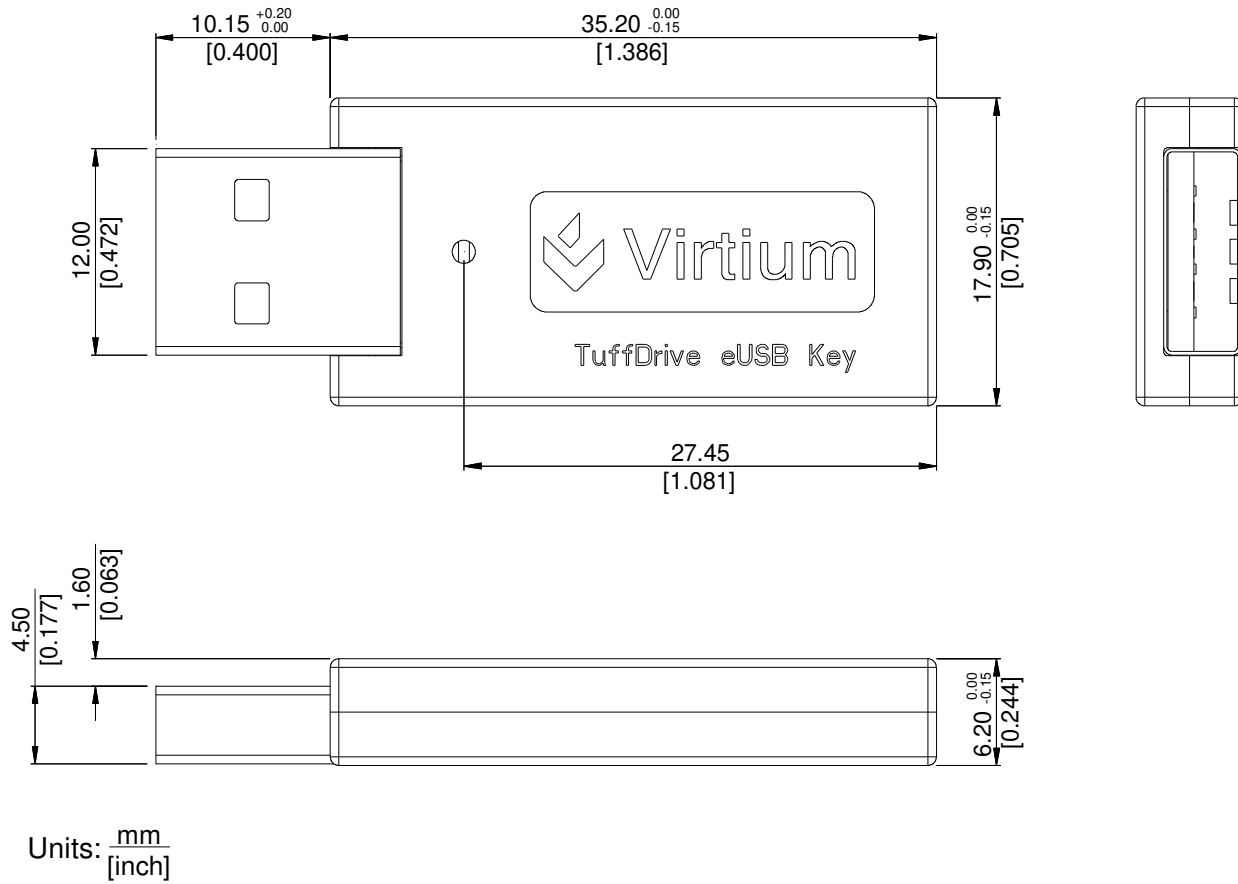


Figure 2: Mechanical Dimensions



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|---|-----------------|
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6.0 Revision History

| Date | Rev. | Page | Changes |
|----------|------|------|--|
| 2/6/2015 | 08 | All | Initial Release – Priliminary SVN 3198 |
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