Virtium

TuffDrive™

Virtium eUSB Key

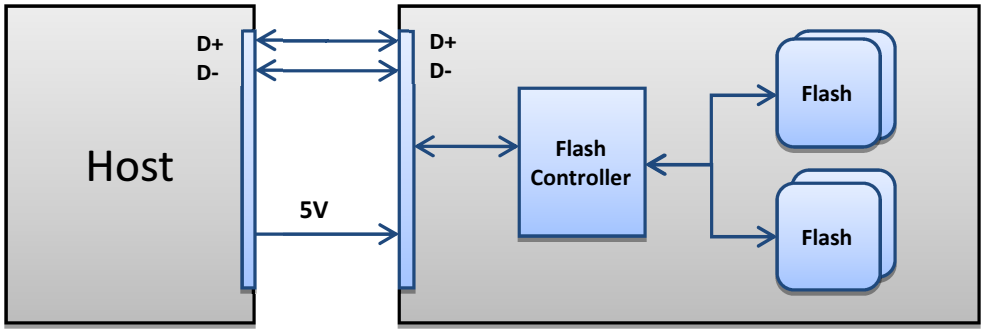
Product Specification
VUS eUSB Key

1.0 Introduction

Virtium's VUS eUSB Key is a small, portable device that plugs into your computer's USB port. Virtium's VUS eUSB Key is designed for applications requiring long life, small form factor, and the ability to withstand shock, vibration, high altitude, and temperature fluctuations.

Features

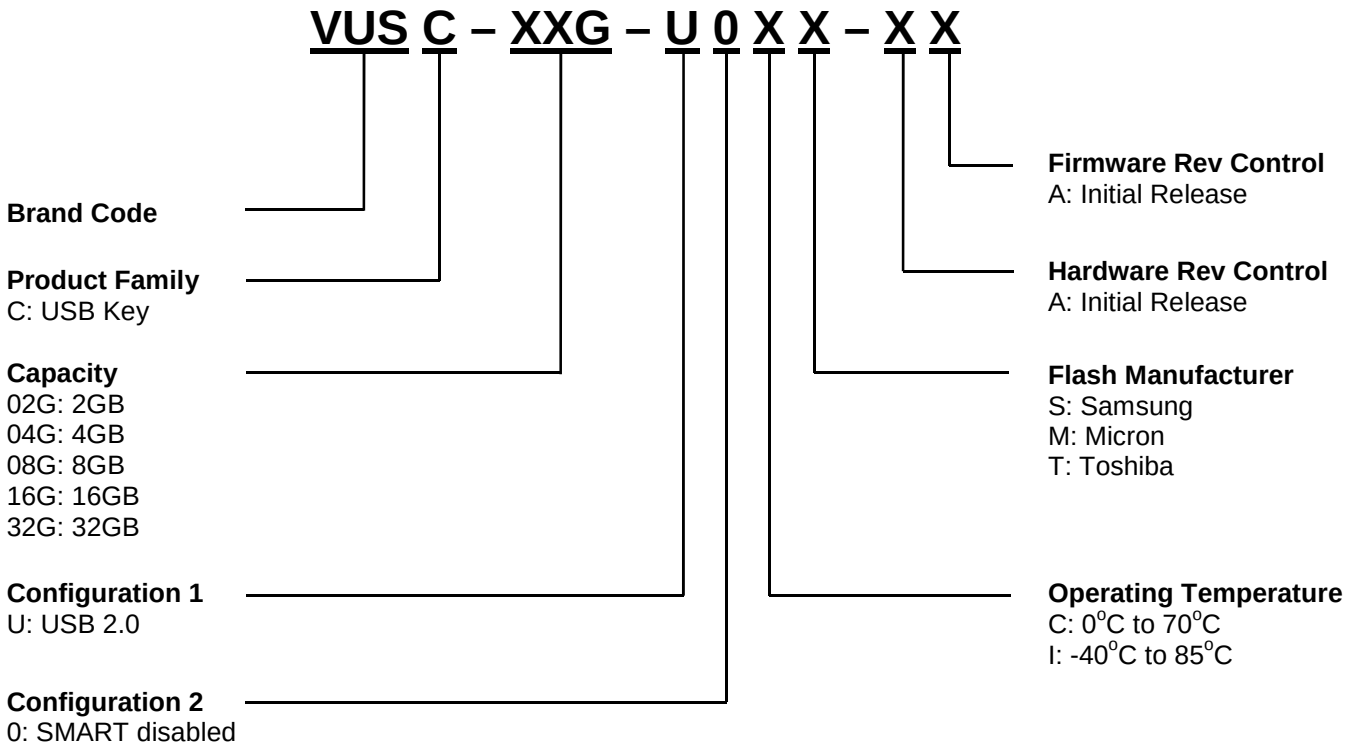
- 2GB to 32GB Capacity
- USB 2.0 Compliant
- Unique Serial Number
- Performance
  - Sustained Read Performance: Up to 30MB/s
  - Sustained Write Performance: Up to 15MB/s
- High Reliability
  - 2 Million Program/Erase Cycles
  - Static Wear-Leveling
  - ECC algorithm corrects up to 8 bits per 512 bytes
  - Single Level Cell (SLC) NAND flash memory
  - 10 Years data retention
  - MTBF > 3,000,000 hours @ 25oC
- Operating Temperature
  - Commercial: 0oC to 70oC
  - Industrial: -40oC to 85oC
- Storage Temperature
  - -55^{o}C to 95^{o}C
- Input Voltage
  - 5V +/-10%
- Compliance
  - RoHS
  - FCC and CE
- Form Factor
  - USB Type-A connector



2.0 Ordering Information and Part Numbering System

Table 1: Ordering information

Part Number	Description
VUSC-02G-U0CX-XX	2GB, Commercial 0°C to 70°C, USB type-A connector
VUSC-04G-U0CX-XX	4GB, Commercial 0°C to 70°C, USB type-A connector
VUSC-08G-U0CX-XX	8GB, Commercial 0°C to 70°C, USB type-A connector
VUSC-16G-U0CX-XX	16GB, Commercial 0°C to 70°C, USB type-A connector
VUSC-32G-U0CX-XX	32GB, Commercial 0°C to 70°C, USB type-A connector
VUSC-02G-U0IX-XX	2GB, Industrial -40°C to +85°C, USB type-A connector
VUSC-04G-U0IX-XX	4GB, Industrial -40°C to +85°C, USB type-A connector
VUSC-08G-U0IX-XX	8GB, Industrial -40°C to +85°C, USB type-A connector
VUSC-16G-U0IX-XX	16GB, Industrial -40°C to +85°C, USB type-A connector
VUSC-32G-U0IX-XX	32GB, Industrial -40°C to +85°C, USB type-A connector



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3.0 Specifications

3.1 Environmental Specifications

3.1.1 Temperature Range

Commercial Grade Operating Temperature Range: 0℃ t o 70°C

Industrial Grade Operating Temperature Range: -40℃ to +85°C

Storage Temperature Range: -55℃ to +95℃

3.1.2 Humidity

Relative Humidity: 10-95%, non-condensing

3.1.3 Shock and Vibration

Table 2: Shock and Vibration Testing

Reliability	Test Conditions
Vibration	7 to 2000 Hz, 20G, 3 axes
Mechanical Shock	Duration: 10ms, 50G, 3 axes

3.2 System Reliability

3.2.1 ECC Technology

The controller provides hardware and software to implement error correction coding which can detect and correct up to 8 bit errors per 512 Byte sector.

3.2.2 Wear Leveling

The VUS USB Key products support Static Wear Leveling. Wear leveling is required because flash memory has a finite lifetime based on the number of writes and erasures to each individual block. The wear leveling algorithms in the VUS USB Key products move data to distribute block erases and writes across the available block population. The VUS USB Key products use SLC flash devices to enhance endurance, retention and reliability.

3.2.3 Mean Time in Between Failures

Using the Telcordia SR-332 specification at a temperature of 25℃, the Mean Time in Between Failures (MTBF) is calculated to be greater than three million hours.

3.3 Power Requirements

5V (±10%) single power supply operation.

3.3.1 Power Consumption

Table 3: Power Consumption

Parameters	Maximum	Typical
Sustained Read	110 mA	90 mA
Sustained Write	130 mA	110 mA
Standby	90 uA	89 uA

3.4 FCC and CE Requirements

VUS USB Key products conform to CE and FCC requirements.

3.4.1 ROHS Compliance

VUS USB Key products are compliant with the ROHS directive.

3.5 Read/Write Performance

Table 4: Read/Write Performance

Transfer Rate	Value	Units
Sustained Read (max)	30	MB/s
Sustained Write (max)	15	MB/s

4.0 Physical Specification

4.1 Pin Assignments

Table 5: Pin Assignments

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

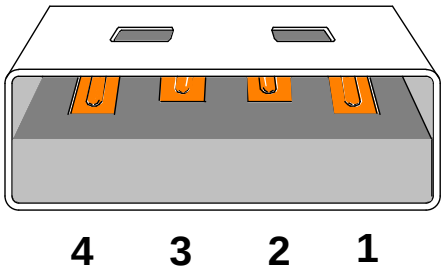

Figure 1: Pin Assignments

4.2 Mechanical Dimensions

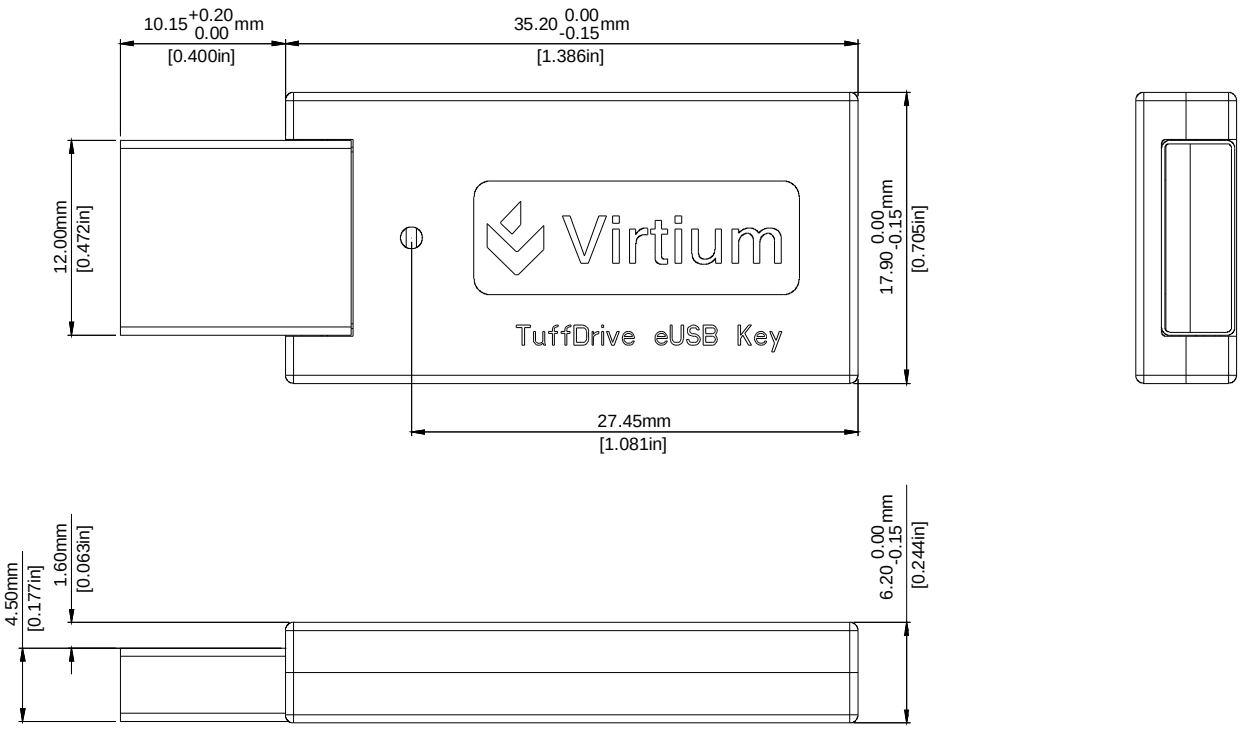

Figure 2: Mechanical Dimensions

5.0 Revision Table

Date	Rev.	Page	Changes
10/27/2011	1.0	All	Spec released
02/05/2012	1.1	3, 9	Product part number change Update Mechanical Dimensions drawing
03/08/2012	1.2	3	Updated Table 1
6/20/2012	1.3	1, 9	Added the product picture and mechanical drawing

FCC ID: OET-EUSB

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment。

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

-- Reorient or relocate the receiving antenna.
-- Increase the separation between the equipment and receiver.
-- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
-- Consult the dealer or an experienced radio/TV technician for help.