

# **Ordering Information: USB 3.0 Thumbdrives**

Viking High Performance USB Drive Ordering Information

| Thung Ingili didinanda deb binto di dening ini dini dalah |              |                         |            |           |                 |  |  |
|---|--------------|-------------------------|------------|-----------|-----------------|--|--|
| Part Number   | Temp         | Raw<br>Capacity<br>(GB) | Controller | Interface | NAND            |  |  |
| VNFUSB3064GCC5WT3   | (0 to +70'c) | 64                      | SMI        | USB 3.0   | TSB 3D TLC NAND |  |  |
| VNFUSB3032GCC1WT3   | (0 to +70'c) | 32                      | SMI        | USB 3.0   | TSB 3D TLC NAND |  |  |
| VNFUSB3016GCCDWT3   | (0 to +70'c) | 16                      | SMI        | USB 3.0   | TSB 3D TLC NAND |  |  |

#### Note:

- 1. Storage capacity listed will vary due to formatting and additional functions, and therefore is not available for storage.
- 2. USB's ship unformatted from the factory unless otherwise stated or requested.
- 3. All USBs are based on TLC flash unless otherwise requested.
- 4. The lower case "xx" characters denotes a wild card to specify locked BOM attributes (i.e MLC NAND or customer specific information
- 5. Modules are 5V standard.

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# Product Picture(s)



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#### 1 Introduction

#### 1.1 Product Overview

Viking Flash Drives are small, removable, high-speed USB 3.0 and USB 2.0 compatible data storage systems using flash technology. USB Drives allow easy data storage and transfer via the USB port on the host system with no driver installation required. The high speed Read/Write operation eliminates latency and seek-time associated with a hard disk drive. Flash storage incorporates an intelligent power management scheme that provides the lowest total power consumption.

#### 1.2 Features

The USB drive delivers the following features:

- USB 3.0 high speed compatible (supports Bulk-Only transport protocol)\*
- Drive Activity indicator signal (Blue LED is on when USB is active)
- Low power Dissipation
- Solid state, Non-volatile NAND Memory
- RoHS Compliant
- Static Wear Leveling
- Write Protect
- Blue mating key inside the metal connector indicates USB 3.0

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<sup>\*</sup> With exception of 3.3V only operation, USB specification is 5V.



#### 1.3 USB Interface

- The USB interface is compliant with the USB 3.0 specification.
- The USB interface connects the host computer to the USB.
- second). If the host computer is unable to negotiate USB 3.0 speeds, the USB interface automatically renegotiates to lower speeds.

### 2 Product Specifications

#### 2.1 Performance

USB 3.0 adds the new transfer rate referred to as SuperSpeed USB (SS) that can transfer data at up to 5 Gbit/s (625 MB/s), which is about 10 times as fast as the older USB 2.0 standard. The actual read/write bandwidth may be lower due to software overhead.

#### 2.2 Electrical Characteristics

### 2.2.1 Absolute Maximum Ratings

Table 2-1: Absolute Maximum Ratings

| Parameter           | Symbol | Value                 | Unit |
|---------------------|--------|-----------------------|------|
| 5.0 Supply Voltage  | VBUS   | -0.3 ~ 5.5            | V    |
| 3.3 Supply Voltage  | VBUS   | -0.3 ~ 3.6            | V    |
| Input Voltage       | VIN    | GND - 0.5 ~ VCC + 0.3 | V    |
| Storage Temperature | TST    | -40 ~ 125             | °C   |

#### Notes

### 2.2.2 DC Operating Conditions and Characteristics

### Table 2-2: Voltage and Current Ratings

| Parameter                 | Symbol | Min. | Typical | Max. | Unit |
|---------------------------|--------|------|---------|------|------|
| 5.0 Supply voltage (± 5%) | VBUS   | 4.75 | 5.0     | 5.25 | V    |

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Permanent device damage may occur if 'ABSOLUTE MAXIMUM RATINGS' are exceeded. Functional operation should be restricted to recommended operating condition. Exposure to higher than recommended voltage for extended periods of time could affect device reliability.



| Parameter                      | Symbol           | Min.  | Typical | Max.   | Unit |
|--------------------------------|------------------|-------|---------|--------|------|
| 3.3 Supply voltage (± 5%)      | VBUS             | 3.135 | 3.3     | 3.465  | V    |
| Input high voltage             | VIH              | 2.0   | -       | -      | V    |
| Input low voltage              | VIL              | -     | -       | 0.8    | V    |
| Output high voltage            | VOH              | 2.4   | -       |        | V    |
| Output low voltage             | VOL              | -     | -       | 0.4    | V    |
| Standby Current <sup>2</sup>   | I <sub>STB</sub> | -     | 22 est  | 56 est | μA   |
| Operating Current <sup>2</sup> | I <sub>OP</sub>  | -     | 140 est | 200    | mΑ   |

#### Notes:

- 1. Recommended operating conditions (Voltages referenced to GND, TA = 0 to 70C)
- 2. Based on 3.3V NAND, BGA or TSOP

#### 2.2.3 Power Consumption

Maximum Power Consumption is 1 watt.

### 2.2.4 Capacitance

**Table 2-3: Bus Line Capacitance** 

| Parameter            | Symbol | Min | Max    | Unit |
|----------------------|--------|-----|--------|------|
| Bus line capacitance | $C_L$  | -   | 20 est | pF   |

#### 2.3 Environmental Conditions

#### 2.3.1 Temperature and Altitude

**Table 2-4: Temperature and Altitude Related Specifications** 

| Conditions               | Operating          | Shipping           | Storage            |
|--------------------------|--------------------|--------------------|--------------------|
| Commercial               | 0 to 70°C          | -40 to 85°C        | -40 to 85°C        |
| Temperature              | (32 to 158° F)     | (-40 to 185° F)    | (-40 to 185° F)    |
| Industrial               | -40 to 85°C        | -40 to 85°C        | -40 to 85°C        |
| Temperature <sup>1</sup> | (-40 to 185° F)    | (-40 to 185° F)    | (-40 to 185° F)    |
| Humidity (non-           | 5% to 95%          | 5% to 95%          | 5% to 95%          |
| condensing)              | 570 10 9570        | 3% 10 95%          | 5 % 10 95 %        |
| Max Temperature          | 20°C/Hour          | n/a                | n/a                |
| Gradient                 | (36°F/Hour)        | 11/a               | 11/4               |
| Altitude                 | -304.8 to 24,384 m | -304.8 to 24,384 m | -304.8 to 24,384 m |

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|                       | (-1,000 to 80,000 ft) | (-1,000 to 80,000 ft) | (-1,000 to 80,000 ft) |
|-----------------------|-----------------------|-----------------------|-----------------------|
| Storage Time Duration | n/a                   | n/a                   | 1 year                |

#### Notes:

- 1. TLC flash based products are available in the following temperature ranges:
  - a) Commercial temperature range of 0 to 70°C (32 to 158° F)
  - b) Industrial temperature range -40 to 85°C (-40 to 185° F)

### 2.4 Reliability

### **Table 2-5: Reliability Specifications**

| Parameter                         | Value                              |
|-----------------------------------|------------------------------------|
| Mean Time Between Failures (MTBF) | 2,500,000 hours est                |
| Read Endurance                    | Unlimited                          |
| Write or Erase Endurance          | (specified by the flash component) |
| Data retention                    | >10 years                          |

### 3 Mechanical Information

### 3.1 Physical Dimensions

**Table 3-1: Physical Dimensions** 

| Height (mm) | Width (mm) | Length (mm) |
|-------------|------------|-------------|
| 13          | 21.9       | 72          |

#### Notes:

### 3.2 Weight

The USB weight is 10grams

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<sup>1.</sup> All dimensions are in millimeters.



# 4 Pin and Signal Descriptions

**Table 4-1: Pin Assignments** 

| Pin<br>Number | Signal Name | Description                              | Mating Sequence |
|---------------|-------------|--|-----------------|
| 1             | VBUS        | Power                                    | Second          |
| 2             | D-          | HOD on liff and the last                 | Third           |
| 3             | D+          | USB 2.0 differential pair                | Third           |
| 4             | GND         | Ground for power return                  | Second          |
| 5             | StdA_SSRX-  | Cuparenand receiver differential pair    |                 |
| 6             | StdA_SSRX+  | SuperSpeed receiver differential pair    |                 |
| 7             | GND_DRAIN   | Ground for signal return                 | Last            |
| 8             | StdA_SSTX-  | Compared transposition differential pair |                 |
| 9             | StdA_SSTX+  | SuperSpeed transmitter differential pair |                 |
| Shell         | Shield      | Connector metal shell                    | First           |

#### Notes:

- 1. Tx and Rx are defined from the host perspective
- 2. Note that pins 1 to 4 are referred to as the USB 2.0 pins, while pins 5 to 9 are referred to as the SuperSpeed pins.

# 5 Certifications and Compliance

**Table 5-1: Device Certifications** 

| Certification/Compliance | Description  |
|--------------------------|--|
| RoHS                     | Viking, Sanmina-SCI Corporation ("Viking") shall use commercially reasonable efforts to provide components, parts, materials, products and processes to customers that do not contain: (i) lead, mercury, hexavalent chromium, polybrominated biphenyls (PBB) and polybrominated diphenyl ethers (PBDE) above 0.1% by weight in homogeneous material or (ii) cadmium above 0.01% by weight of homogeneous material, except as provided in any exemption(s) from RoHS requirements (including the most current version of the "Annex" to Directive\ 2002/95/EC of 27 January, 2003), as codified in the specific laws of the EU member countries. Viking strives to obtain appropriate contractual protections from its suppliers in connection with the RoHS Directives. |
| EU WEEE Compliant        | The Waste Electrical and Electronic Equipment Directive (WEEE Directive) is the European Community directive 2002/96/EC on waste electrical and electronic equipment (WEEE) which, together with the RoHS Directive 2002/95/EC, became European Law in February 2003, setting collection, recycling and recovery targets for all types of electrical goods.  |

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| Certification/Compliance | Description  |
|--------------------------|--|
| Safety                   | All printed circuit boards (PCBs) have a flammability rating of UL94V-0. |

### 6 References

- USB Specification, version 3.0
- https://en.wikipedia.org/wiki/USB\_3.0

# 7 Revision History

| Revision | Release Date | Description of Change  | Checked By (Full<br>Name) |
|----------|--------------|--|---------------------------|
| А        | 7/25/18      | Initial release based on modified PSFUSB2XXXXCXX. Update performance and revise pin assignment |                           |
|          |              |  |                           |
|          |              |  |                           |

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