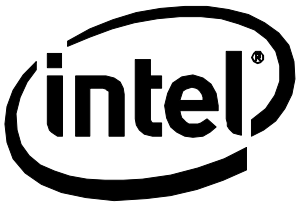

Intel® Compute Stick
STK2M3W64CC
STK2MV64CC
STK2M364CC
Technical Product Specification

October 2017
Order Number: H86345-004

Revision History

Revision	Revision History	Date
001	First release	February 2016
002	Updated Section 1.3 Operating System Overview	May 2016
003	Updated Section 1.3 Operating System Overview	June 2016
004	Updated HDMI audio section	October 2017

Disclaimer

This product specification applies to only the standard Intel® Compute Stick with BIOS identifier CCSKLM30.86A or CCSKLM5V.86A.

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Preface

This Technical Product Specification (TPS) specifies the layout, components, connectors, power and environmental requirements, and the BIOS for Intel Compute Stick STK2M3W64CC, STK2M364CC and STK2MV64CC.

NOTE

In this document, the use of "Intel Compute Stick" will refer to the STK2M3W64, STK2M364CC and STK2MV64CC versions of the Intel Compute Stick.

Intended Audience

The TPS is intended to provide detailed technical information about Intel Compute Stick STK2M3W64CC, STK2M364CC and STK2MV64CC and its components to the vendors, system integrators, and other engineers and technicians who need this level of information. It is specifically *not* intended for general audiences.

What This Document Contains

Chapter	Description
1	A description of the hardware used on Intel Compute Stick STK2M3W64CC, STK2M364CC and STK2MV64CC
2	A map of the resources of the Intel Compute Stick
3	The features supported by the BIOS Setup program

Typographical Conventions

This section contains information about the conventions used in this specification. Not all of these symbols and abbreviations appear in all specifications of this type.

Notes, Cautions, and Warnings

NOTE

Notes call attention to important information.

CAUTION

Cautions are included to help you avoid damaging hardware or losing data.

Other Common Notation

#	Used after a signal name to identify an active-low signal (such as USBP0#)
GB	Gigabyte (1,073,741,824 bytes)
GB/s	Gigabytes per second
Gb/s	Gigabits per second
KB	Kilobyte (1024 bytes)
Kb	Kilobit (1024 bits)
kb/s	1000 bits per second
MB	Megabyte (1,048,576 bytes)
MB/s	Megabytes per second
Mb	Megabit (1,048,576 bits)
Mb/s	Megabits per second
TDP	Thermal Design Power
Xxh	An address or data value ending with a lowercase h indicates a hexadecimal value.
x.x V	Volts. Voltages are DC unless otherwise specified.
*	This symbol is used to indicate third-party brands and names that are the property of their respective owners.

Contents

Figures

Tables

1 Product Description

1.1 Overview

1.1.1 Version Summary

There are three different versions of this model of Intel® Compute Stick available which are summarized in Table 1. Unless otherwise noted in this document all features are available on all versions of the Intel Compute Stick.

Table 1. Version Summary

Version	Intel® vPro™	TPM	Processor	OS Pre-installed
STK2M3W64CC	No	No	Intel® Core™ m3, M3-6Y30	Yes, Windows 10
STK2MV64CC	Yes	Yes	Intel® Core™ m5, M5-6Y57	No
STK2M364CC	No	Yes	Intel® Core™ m3, M3-6Y30	No

1.1.2 Feature Summary

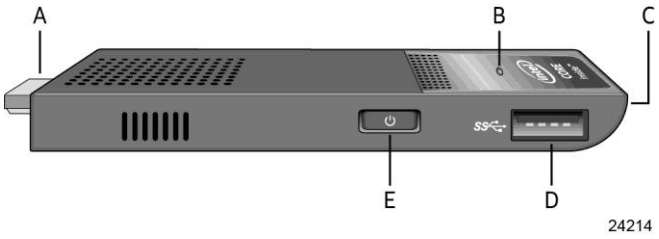
Table 2 summarizes the major features of the Intel Compute Stick.

Table 2. Feature Summary

Form Factor	114 millimeters by 38 millimeters by 12 millimeters (4.48819 inches by 1.49606 inches by 0.4724 inches)
Processor	• Soldered-down Intel® Core™ M processor — Integrated graphics — Integrated memory controller — Integrated PCH
Memory	• Soldered-down dual-channel LPDDR3 1866 MHz memory • 4 GB total memory
Graphics	• Integrated graphics support with Intel® HD Graphics Technology: — High Definition Multimedia Interface* (HDMI*)
Audio	Intel® High Definition (Intel® HD) Audio via the HDMI v1.4b interface
Peripheral Interfaces	One full size USB 3.0 port
Storage	• 64 GB soldered-down Embedded MultiMediaCard (eMMC) onboard storage • One Micro SD card slot (SDXC v3.0 with UHS-I support)
BIOS	• Intel® BIOS resident in the Serial Peripheral Interface (SPI) Flash device • Support for Advanced Configuration and Power Interface (ACPI), Plug and Play, and System Management BIOS (SMBIOS)
Wireless LAN	Soldered-down Intel® Dual Band Wireless-AC module • 802.11a/b/g/n, 802.11ac, Bluetooth* 4.2 • Supports Intel® Wireless Display (WiDi)
Intel® vPro™ Technologies (STK2MV64CC only)	• Intel® Active Management Technology (Intel® AMT) 11.0 • Intel® Virtualization Technology (Intel® VT) • Intel® Virtualization for Directed I/O (Intel® VT-d) • Intel® Trusted Execution Technology (Intel® TXT) • Intel® Identity Protection Technology (Intel® IPT) • Trusted Platform Module 2.0 (TPM) (Also available on STK2M364CC)

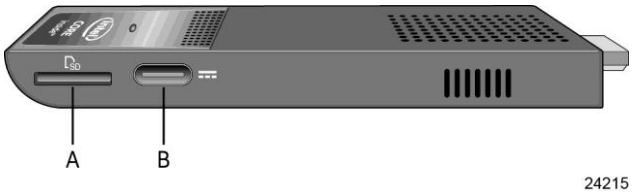
1.1.3 Location of Components

Figures 1 and 2 show the location of the components on the Intel Compute Stick.



Item	Description
A	HDMI Connector
B	Power LED
C	Security Loop
D	USB 3.0 Connector
E	Power On/Off Button

Figure 1. Left-Side View of Intel Compute Stick



Item	Description
A	Micro SD Card Reader Slot
B	5 V DC Connector

Figure 2. Right-Side View of Intel Compute Stick

1.1.4 Block Diagram

Figure 3 is a block diagram of the major functional areas of the Intel Compute Stick.

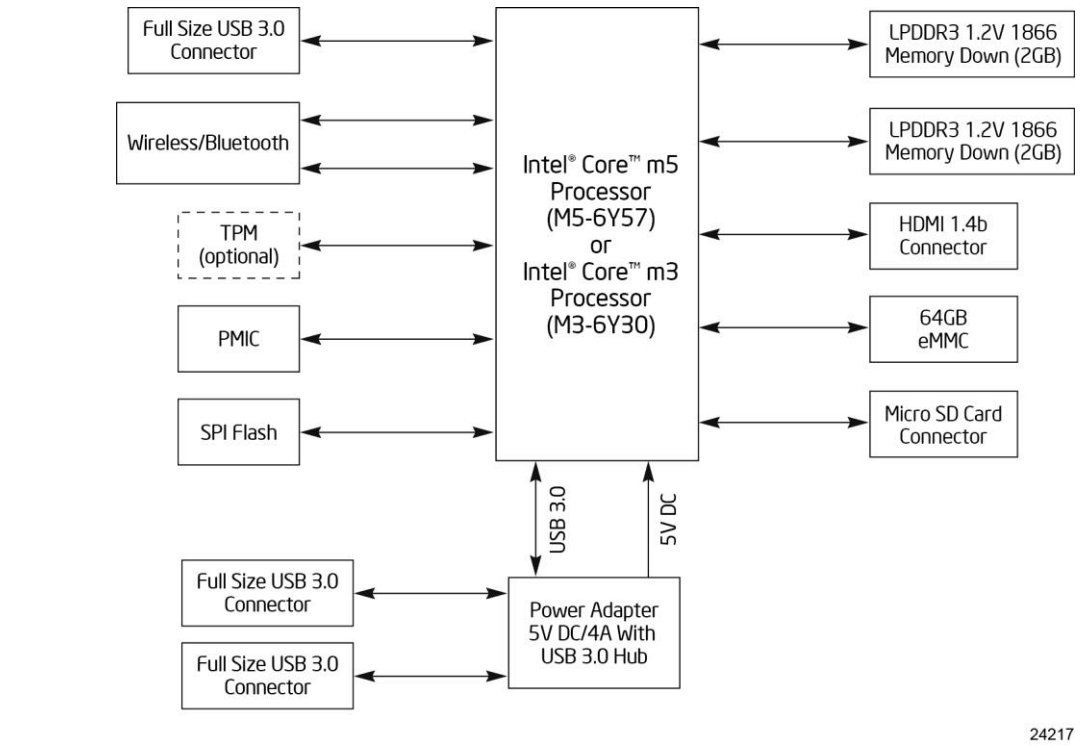


Figure 3. Block Diagram

1.2 Online Support

To find information about...	Visit this World Wide Web site:
Intel Compute Stick	http://www.intel.com/computesticksupport

1.3 Operating System Overview

The STK2M3W64CC Compute Stick has Windows 10 Home 64-bit pre-installed with all necessary drivers.

The STK2M364CC and STK2MV64CC Compute Sticks support the following Operating Systems (64-bit only).

- Windows* 10 Home
- Windows 10 Pro
- Windows 10 Enterprise
- Windows 10 Education
- Windows 10 IoT Enterprise
- Windows 8.1
- Windows 8.1 Pro
- Windows 8.1 Enterprise
- Windows Embedded 8.1 Industry
- Some Linux* operating systems may be supported. Check with the specific Linux distribution to make sure that support is available for this platform.

Installation of any of the above operating systems will require a wired USB mouse and keyboard along with a USB flash drive or USB optical drive. The USB flash drive or USB optical drive will need the operating system installation media.

To find information about...	Visit this World Wide Web site:
Intel Compute Stick drivers	http://downloadcenter.intel.com

1.4 Processor

The Intel Compute Stick has a soldered-down System-on-a-Chip (SoC), which consists of an Intel Core m5 processor (M5-6Y57) on the STK2MV64CC and an Intel Core m3 processor (M3-6Y30) on the STK2M3W64CC and the STK2M364CC.

- Integrated Intel® HD Graphics 515
- Integrated memory controller
- Integrated PCH

1.5 System Memory

The Intel Compute Stick has soldered-down memory and supports the following memory features:

- LPDDR3 1866 MHz
- Dual-channel memory
- 2 GB memory per channel (4 GB total memory)
- Refer to Section 2.1.1 on page 22 for information on the total amount of addressable memory

1.6 System Storage

The Intel Compute stick has soldered-down storage using an Embedded MultiMediaCard (eMMC) component. All Compute Sticks have 64 GB of total storage.

NOTE

STK2M3W64CC uses a portion of this total storage for the operating system.

1.7 Processor Graphics Subsystem

The Intel Compute Stick supports graphics through Intel HD Graphics.

1.7.1 Integrated Graphics

The Intel Compute Stick supports integrated graphics via the processor.

1.7.1.1 Intel® High Definition (Intel® HD) Graphics

The Intel HD graphics controller features the following:

- HDMI 1.4b
- 3D graphics hardware acceleration supporting DirectX*12, OpenCL 2.0, OGL ES Halti/2.0/1.1, OpenGL 4.3/4.4
- Video decode hardware acceleration supporting H.264, H.265, JPEG, MJPEG, MPEG2, MVC, VC-1, VP8 and VP9 formats
- Video encode hardware acceleration supporting H.264, H.265, JPEG, MJPEG, MPEG2, VC-1, VP8, VP9 and MVC formats
- High-Bandwidth Digital Content Protection (HDCP) 1.4 support for content protection

1.7.1.2 Video Memory Allocation

Intel® Dynamic Video Memory Technology (DVMT) is a method for dynamically allocating system memory for use as graphics memory to balance 2D/3D graphics and system performance. If your computer is configured to use DVMT, graphics memory is allocated based on system requirements and application demands (up to the configured maximum amount). When memory is no longer needed by an application, the dynamically allocated portion of memory is returned to the operating system for other uses.

1.7.1.3 High Definition Multimedia Interface* (HDMI*)

The HDMI port supports standard, enhanced, or high definition video, plus multi-channel digital audio on a single cable. The port is compatible with all ATSC and DVB HDTV standards and supports eight full range channels of lossless audio formats. The maximum supported resolution is 4096 x 2160 @ 24 Hz, 24 bpp. 2560 x 1600 @ 60Hz is also supported. The HDMI port is compliant with the HDMI 1.4b specification.

1.7.1.3.1 Integrated Audio Provided by the HDMI Interfaces

The following audio technologies are supported by the HDMI 1.4b interface directly from the SoC:

- AC3 - Dolby* Digital
- Dolby Digital Plus
- LPCM, 192 kHz/16-bit or 176.4 kHz/24-bit, 8 Channel

1.8 USB

The Compute Stick has one full size USB 3.0 port with maximum current of 900 mA. The USB port is super-speed, high-speed, full-speed, and low-speed capable.

NOTE

Computer systems that have an unshielded cable attached to a USB port may not meet FCC Class B requirements, even if no device is attached to the cable. Use a shielded cable that meets the requirements for full-speed devices.

1.9 Wireless LAN Subsystem

The wireless LAN subsystem consists of the following:

- Intel® Dual Band Wireless-AC 8260 module
- 1216 BGA soldered-down

For information about	Refer to
LAN software and drivers	http://downloadcenter.intel.com

1.9.1 Wireless Network Module

The Dual Band Wireless-AC 8260 module provides hi-speed wireless connectivity with the following capabilities:

- 802.11a/b/g/n, 802.11ac
- 2.4 GHz, 5.0 GHz
- Two antennas
- Dual Mode Bluetooth 4.2
- Supports Intel® Wireless Display (WiDi)
- Support for AMT 11.0 on STK2MV64CC

For information about	Refer to
Obtaining WLAN software and drivers	http://downloadcenter.intel.com
Full Specifications	http://intel.com/wireless

1.10 Hardware Management Subsystem

The hardware management features enable the Compute Stick to be compatible with the Wired for Management (WfM) specification. The Compute Stick has several hardware management features, including thermal and voltage monitoring.

For information about	Refer to
Wired for Management (WfM) Specification	www.intel.com/design/archives/wfm/

1.11 Power Management

Power management is implemented at several levels, including:

- Software support through Advanced Configuration and Power Interface (ACPI)
- Hardware support:
  - Power Input
  - Instantly Available PC technology
  - Wireless LAN wake capabilities
  - Wake from USB
  - Wake from S5

1.11.1 ACPI

ACPI gives the operating system direct control over the power management and Plug and Play functions of a computer. The use of ACPI with this Compute Stick requires an operating system that provides full ACPI support. ACPI features include:

- Plug and Play (including bus and device enumeration)
- Power management control of individual devices
- A Soft-off feature that enables the operating system to power-off the computer
- Support for multiple wake-up events (see Table 5 on page 17)

Table 3 lists the system states based on how long the power switch is pressed, depending on how ACPI is configured with an ACPI-aware operating system.

Table 3. Effects of Pressing the Power Switch

If the system is in this state...	...and the power switch is pressed for	...the system enters this state
Off (ACPI G2/G5 – Soft off)	Less than four seconds	Power-on (ACPI G0 – working state)
On (ACPI G0 – working state)	Less than four seconds	Soft-off/Standby (ACPI G1 – sleeping state) Note
On (ACPI G0 – working state)	More than six seconds	Fail safe power-off (ACPI G2/G5 – Soft off)
Sleep (ACPI G1 – sleeping state)	Less than four seconds	Wake-up (ACPI G0 – working state)
Sleep (ACPI G1 – sleeping state)	More than six seconds	Power-off (ACPI G2/G5 – Soft off)

Note: Depending on power management settings in the operating system.

1.11.1.1 System States and Power States

Under ACPI, the operating system directs all system and device power state transitions. The operating system puts devices in and out of low-power states based on user preferences and knowledge of how devices are being used by applications. Devices that are not being used can be turned off. The operating system uses information from applications and user settings to put the system as a whole into a low-power state.

Table 4 lists the power states supported by the Compute Stick along with the associated system power targets. See the ACPI specification for a complete description of the various system and power states.

Table 4. Power States and Targeted System Power

Global States	Sleeping States	Processor States	Device States	Targeted System Power (Note 1)
G0 – working state	S0 – working	C0 – working	D0 – working state.	Full power
G1 – sleeping state	S3 – Suspend to RAM. Context saved to RAM.	No power	D3 – no power except for wake-up logic.	Power < 5 W (Note 2)
G1 – sleeping state	S4 – Suspend to disk. Context saved to disk.	No power	D3 – no power except for wake-up logic.	Power < 5 W (Note 2)
G2/S5	S5 – Soft off. Context not saved. Cold boot is required.	No power	D3 – no power except for wake-up logic.	Power < 5 W (Note 2)
G3 – mechanical off AC power is disconnected from the computer.	No power to the system.	No power	D3 – no power for wake-up logic.	No power to the system. Service can be performed safely.

Notes:

1. Total system power is dependent on the system configuration and peripherals powered by the system power supply.
2. Dependent on the standby power consumption of wake-up devices used in the system.

1.11.1.2 Wake-up Devices and Events

Table 5 lists the devices or specific events that can wake the Compute Stick from specific states.

Table 5. Wake-up Devices and Events

Devices/events that wake up the system…	…from this sleep state	Comments
Power switch	S3, S4, S5	
RTC alarm	S3, S4, S5 (Note 1)	Monitor to remain in sleep state
Wireless LAN (only on STK2MV64CC)	S3, S4, S5 (Notes 1, 2)	"S5 WOL after G3" supported; monitor to remain in sleep state
USB	S3, S4, S5 (Note 3, 4)	Wake S4, S5 controlled by BIOS option
Bluetooth	S3	

Notes:

1. Monitor will remain in "sleep" state
2. "S5 WoL after G3" only supported w/Deep Sleep disabled
3. Wake from S4 and S5 only supported w/Deep Sleep disabled
4. Wake from device/event not supported immediately upon return from AC loss

NOTE

The use of these wake-up events from an ACPI state requires an operating system that provides full ACPI support. In addition, software, drivers, and peripherals must fully support ACPI wake events.

1.11.2 Hardware Support

Power management hardware features include:

- Wake from Power Button signal
- Instantly Available PC technology
- Wireless LAN wake capabilities
- Wake from USB
- Wake from S5

NOTE

The use of Wake from USB from an ACPI state requires an operating system that provides full ACPI support.

1.11.2.1 Power Input

When resuming from an AC power failure, the Compute Stick may return to the power state it was in before power was interrupted (on or off). The Compute Stick's response can be set using the Last Power State feature in the BIOS Setup program's Boot menu.

1.11.2.2 Instantly Available PC Technology

Instantly Available PC technology enables the Compute Stick to enter the ACPI S3 (Suspend-to-RAM) sleep-state. While in the S3 sleep-state, the computer will appear to be off (the power supply is off, and the front panel off). When signaled by a wake-up device or event, the system quickly returns to its last known wake state. Table 5 on page 17 lists the devices and events that can wake the Compute Stick from the S3 state.

The use of Instantly Available PC technology requires operating system.

1.11.2.3 Wireless LAN Wake Capabilities

Wireless LAN wake capabilities enable remote wake-up of the Compute Stick through a network. The Wireless LAN subsystem monitors network traffic at the Media Independent Interface. Upon detecting a Magic Packet* frame, the Wireless LAN subsystem asserts a wake-up signal that powers up the Compute Stick. Only available on STK2MV64CC.

1.11.2.4 Wake from USB

USB bus activity wakes the Compute Stick from an ACPI S3, S4, and S5 states.

NOTE

Wake from USB requires the use of a USB peripheral that supports Wake from USB.

1.11.2.5 Wake from S5

When the RTC Date and Time is set in the BIOS, the Compute Stick will automatically wake from an ACPI S5 state.

1.12 Intel® Security and Manageability Technologies

Intel® Security and Manageability Technologies provides tools and resources to help small business owners and IT organizations protect and manage their assets in a business or institutional environment.

NOTE

Software with security and/or manageability capability is required to take advantage of Intel platform security and/or management technologies.

1.12.1 Intel® vPro™ Technology

Only available on the STK2MV64CC. Intel® vPro™ Technology is a collection of platform capabilities that support enhanced manageability, security, virtualization and power efficiency. The key platform capabilities include:

- Intel® Active Management Technology (Intel® AMT) 11.0
- Intel® Virtualization (Intel® VT)
- Intel® Virtualization for Directed I/O (Intel® VT-d)
- Intel® Trusted Execution Technology (Intel® TXT)
- Intel® Identity Protection Technology (Intel® IPT)
- Trusted Platform Module 2.0 (TPM)

For information about	Refer to
Intel vPro Technology	http://support.intel.com/support/vpro/

1.12.1.1 Intel® Active Management Technology 11.0

Only available on the STK2MV64CC. When used with third-party management and security applications, Intel Active Management Technology (Intel AMT) allows business owners and IT organizations to better discover, heal, and protect their networked computing assets.

Some of the features of Intel AMT include:

- Out-of-band (OOB) system access, to discover assets even while PCs are powered off
- Remote trouble-shooting and recovery, which allows remote diagnosis and recovery of systems after OS failures
- Hardware-based agent presence checking that automatically detects and alerts when critical software agents have been stopped or are missing
- Proactive network defense, which uses filters to block incoming threats while isolating infected clients before they impact the network
- Remote hardware and software asset tracking, helping to track computer assets and keep virus protection up-to-date
- Keyboard, video and mouse (KVM) remote control, which allows redirection of a managed system's video to a remote console which can then interact with it using the console's own mouse and keyboard

NOTE

Intel AMT requires the Compute Stick to have network hardware and software, as well as connection with a power source, a corporate network connection, and an Intel AMT-enabled remote management console. Setup requires additional configuration of the platform.

For information about	Refer to
Intel Active Management Technology	http://www.intel.com/technology/platform-technology/intel-amt/index.htm

1.12.1.2 Intel® Virtualization Technology

Intel Virtualization Technology (Intel VT) is a hardware-assisted technology that, when combined with software-based virtualization solutions, provides maximum system utilization by consolidating multiple environments into a single server or client.

NOTE

A processor with Intel VT does not guarantee that virtualization will work on your Compute Stick. Intel VT requires enabling software and/or operating system, device drivers, and applications designed for this feature.

For information about	Refer to
Intel Virtualization Technology	http://www.intel.com/technology/virtualization/technology.htm

1.12.1.3 Intel® Virtualization Technology for Directed I/O

Only available on the STK2MV64CC. Intel Virtualization Technology for Directed I/O (Intel VT-d) allows addresses in incoming I/O device memory transactions to be remapped to different host addresses. This provides Virtual Machine Monitor (VMM) software with:

- Improved reliability and security through device isolation using hardware assisted remapping.
- Improved I/O performance and availability by direct assignment of devices.

For information about	Refer to
Intel Virtualization Technology for Directed I/O	https://software.intel.com/en-us/node/139035?wapkw=vt+directed+io

1.12.1.4 Intel® Trusted Execution Technology

Only available on the STK2MV64CC. Intel Trusted Execution Technology (Intel TXT) is a hardware security solution that protects systems against software-based attacks by validating the behavior of key components at startup against a known good source. It requires that Intel VT be enabled and the presence of a TPM.

For information about	Refer to
Intel Trusted Execution Technology	http://www.intel.com/content/www/us/en/architecture-and-technology/trusted-execution-technology/malware-reduction-general-technology.html

1.12.1.5 Intel® Identity Protection Technology

Intel Identity Protection Technology (Intel IPT) provides a simple way for websites and enterprises to validate that a user is logging in from a trusted computer. This is accomplished by using the Intel Manageability Engine embedded in the chipset to generate a six-digit number that, when coupled with a user name and password, will generate a One-Time Password (OTP) when visiting Intel IPT-enabled websites. Intel IPT eliminates the need for the additional token or key fob required previously for two-factor authentication.

For information about	Refer to
Intel Identity Protection Technology	http://ipt.intel.com

1.12.1.6 Trusted Platform Module (TPM)

Only available on the STK2MV64CC and the STK2M364CC. The TPM version 2.0 component is specifically designed to enhance platform security above-and-beyond the capabilities of today's software by providing a protected space for key operations and other security critical tasks. Using both hardware and software, the TPM protects encryption and signature keys at their most vulnerable stages—operations when the keys are being used unencrypted in plain-text form. The TPM shields unencrypted keys and platform authentication information from software-based attacks.

NOTE

Support for TPM version 2.0 requires a UEFI-enabled operating system.

For information about	Refer to
Nuvoton NPCT650AAAYx	www.nuvoton.com

2 Technical Reference

2.1 Memory Resources

2.1.1 Addressable Memory

The Intel Compute Stick utilizes up to 4 GB of addressable system memory. Typically the address space that is allocated for PCI Conventional bus add-in cards, PCI Express configuration space, BIOS (SPI Flash device), and chipset overhead resides above the top of DRAM (total system memory). On a system that has 8 GB of system memory installed, it is not possible to use all of the installed memory due to system address space being allocated for other system critical functions. These functions include the following:

- BIOS/SPI Flash device
  - 64 Mb on STK2M3W64CC and STK2M364CC
  - 128 Mb on STK2MV64CC
- Local APIC (19 MB)
- Direct Media Interface (40 MB)
- PCI Express configuration space (256 MB)
- SoC base address registers PCI Express ports (up to 256 MB)
- Integrated graphics shared memory (up to 512 MB; 64 MB by default)

The Intel Compute Stick provides the capability to reclaim the physical memory overlapped by the memory mapped I/O logical address space. Physical memory is remapped from the top of usable DRAM boundary to the 4 GB boundary to an equivalent sized logical address range located just above the 4 GB boundary. All installed system memory can be used when there is no overlap of system addresses.

2.2 Connectors

This section describes the connectors available on the Intel Compute Stick.

2.2.1 USB 3.0 Connector

The Intel Compute Stick has a single full size USB 3.0 connector that supports compliant USB devices. Bootable USB devices are supported.

Figure 4. USB 3.0 Connector

NOTE

It is recommended to only use a powered USB Hub with the Compute Stick's USB port.

2.2.2 Micro SD Card Reader

The Intel Compute Stick has a microSecure Digital (SD) card reader that supports the Secure Digital eXtended Capacity (SDXC) format. Micro SD card 8 GB, 16 GB, 32 GB, 64 GB and 128 GB sizes are supported.

Figure 5. Micro SD Card Reader

2.2.3 Power Adapter Connector

The Intel Compute Stick is powered through a USB 5V DC connector on the side. The maximum current rating is 4A.

Figure 6. Power Adapter Connector

2.2.4 Power Adapter and USB Hub

The Intel Compute Stick uses a 5V 4A AC to DC power adapter with a built in 2-port USB 3.0 Hub. The power adapter is connected to the Intel Compute Stick via a six foot USB Type C cable.

Each USB 3.0 port supports compliant USB devices. Bootable USB devices are supported. Each USB 3.0 port supports a maximum current of 900 mA. The USB 3.0 port is super-speed, high-speed, full-speed, and low-speed capable.

Item	Description
A	5 V DC Connector
B	USB 3.0 connectors

Figure 7. Power Adapter and USB Hub

NOTE

It is recommended to only use a powered USB Hub with the power adapter's USB ports.

NOTE

The supplied power adapter and cable is required to power the Intel Compute Stick. Powering the Intel Compute Stick using any other power source is not supported.

2.2.5 Security Loop

The Intel Compute Stick has a 3mm x 3mm opening in the chassis to allow for securing the Compute Stick.

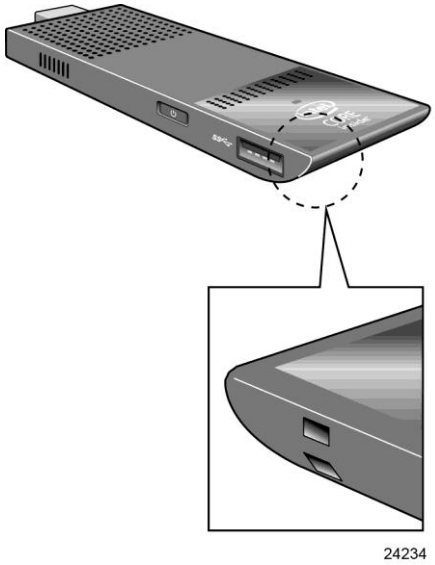


Figure 8. Security Loop Opening

Use of a wire rope type cable that is >3mm can be used with crimps to secure the Compute Stick. One example is shown below. However, many different options are available via 3rd party suppliers.

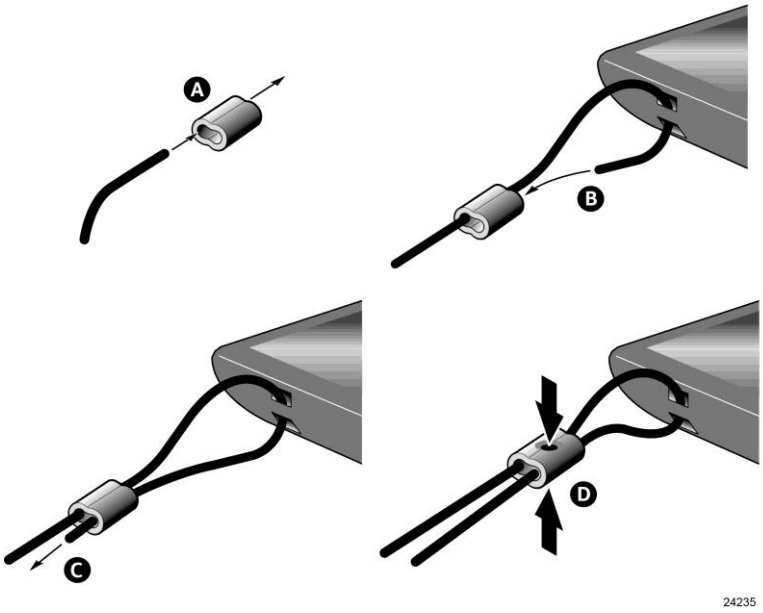


Figure 9. Security Loop Cable Example

2.3 Mechanical Considerations

2.3.1 Form Factor

Figure 10 illustrates the mechanical form factor for the Intel Compute Stick. Dimensions are given in millimeters.

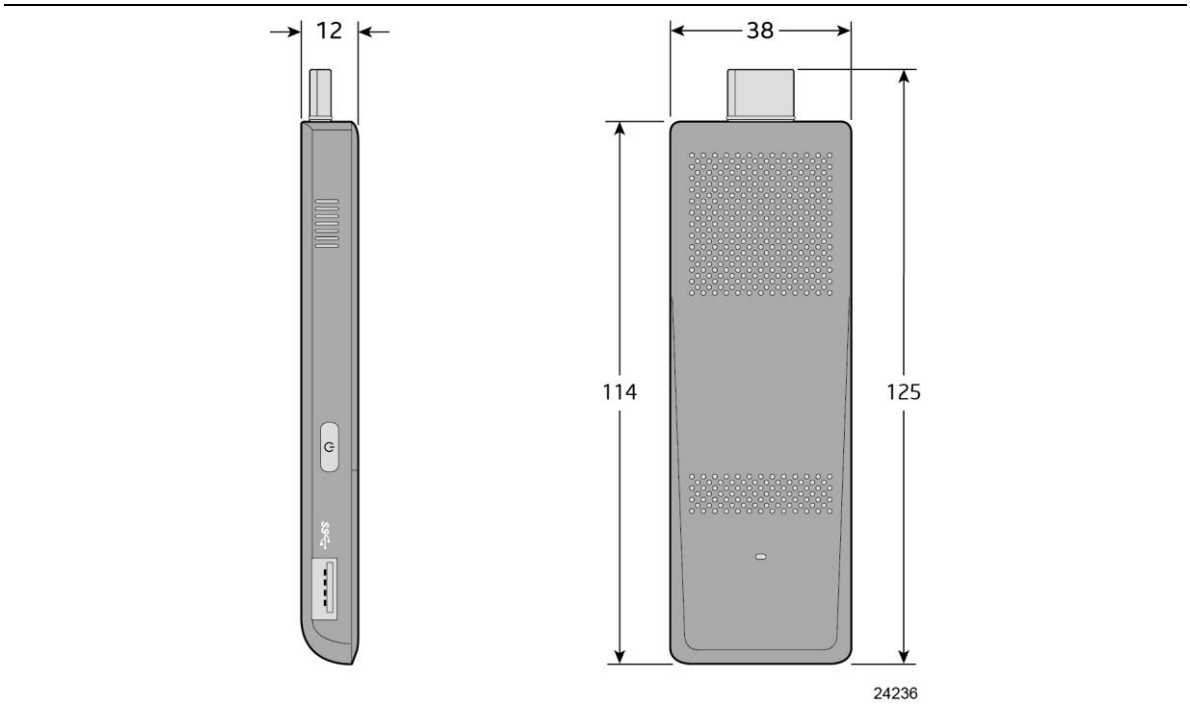


Figure 10. Intel Compute Stick Dimensions

Table 6. Intel Compute Stick Weight Information

Item	Weight
Compute Stick only	60.2g
Compute Stick in package	425.4g

2.4 Reliability

The Mean Time Between Failures (MTBF) prediction is calculated using component and subassembly random failure rates. The MTBF prediction is used to estimate repair rates and spare parts requirements. The MTBF for the Compute Stick is driven by the fan Mean Time to Failure (MTTF) of 46,855 hours.

2.5 Environmental

Table 7 lists the environmental specifications for the Compute Stick.

Table 7. Environmental Specifications

Parameter	Specification		
Temperature			
Non-Operating	-40 °C to +60 °C		
Operating	0 °C to +35 °C The operating temperature of the Compute Stick may be determined by measuring the air temperature from the outside of the chassis while the system is in operation[1].		
Shock			
Unpackaged	80cm drop		
Packaged	Half sine 2 millisecond		
	Product Weight (pounds)	Free Fall (inches)	Velocity Change (inches/s²)
	<20	36	167
	21-40	30	152
	41-80	24	136
	81-100	18	118
Vibration			
Unpackaged	5 Hz to 20 Hz: 0.01 g² Hz sloping up to 0.02 g² Hz		
	20 Hz to 500 Hz: 0.02 g² Hz (flat)		
Packaged	5 Hz to 40 Hz: 0.015 g² Hz (flat)		
	40 Hz to 500 Hz: 0.015 g² Hz sloping down to 0.00015 g² Hz		

1 Before attempting to operate the Compute Stick, the overall temperature of the Compute Stick must be above the minimum and below the maximum operating temperatures specified. The operating and non-operating environment must avoid condensing humidity.

3 Overview of BIOS Features

3.1 Introduction

The Compute Stick uses an Intel BIOS that is stored in the Serial Peripheral Interface Flash Memory (SPI Flash) and can be updated using a disk-based program. The SPI Flash contains the BIOS Setup program, POST, the PCI auto-configuration utility, and Plug and Play support. The initial production BIOSs are identified as CCSKLM30.86A or CCSKLM5V.86A.

The BIOS Setup program can be used to view and change the BIOS settings for the computer, and to update the system BIOS. The BIOS Setup program is accessed by pressing the <F2> key after the Power-On Self-Test (POST) memory test begins and before the operating system boot begins.

3.2 BIOS Flash Memory Organization

The Serial Peripheral Interface Flash Memory (SPI Flash) includes a 128 Mb (16384 KB) flash memory device for STK2MV64CC. A 64 Mb (8192 KB) flash memory device for STK2M3W64CC and STK2M364CC.

3.3 System Management BIOS (SMBIOS)

SMBIOS is a Desktop Management Interface (DMI) compliant method for managing computers in a managed network.

The main component of SMBIOS is the Management Information Format (MIF) database, which contains information about the computing system and its components. Using SMBIOS, a system administrator can obtain the system types, capabilities, operational status, and installation dates for system components. The MIF database defines the data and provides the method for accessing this information. The BIOS enables applications such as third-party management software to use SMBIOS. The BIOS stores and reports the following SMBIOS information:

- BIOS data, such as the BIOS revision level
- Fixed-system data, such as peripherals, serial numbers, and asset tags
- Resource data, such as memory size, cache size, and processor speed
- Dynamic data, such as event detection and error logging

Non-Plug and Play operating systems require an additional interface for obtaining the SMBIOS information. The BIOS supports an SMBIOS table interface for such operating systems. Using this support, an SMBIOS service-level application running on a non-Plug and Play operating system can obtain the SMBIOS information. Additional information can be found in the BIOS under the Additional Information header under the Main BIOS page.

3.4 Legacy USB Support

Legacy USB support enables USB devices to be used even when the operating system's USB drivers are not yet available. Legacy USB support is used to access the BIOS Setup program, and to install an operating system that supports USB. By default, Legacy USB support is set to Enabled.

Legacy USB support operates as follows:

1. When you apply power to the computer, legacy support is disabled.
2. POST begins.
3. Legacy USB support is enabled by the BIOS allowing you to use a USB keyboard to enter and configure the BIOS Setup program and the maintenance menu.
4. POST completes.
5. The operating system loads. While the operating system is loading, USB keyboards and mice are recognized and may be used to configure the operating system. (Keyboards and mice are not recognized during this period if Legacy USB support was set to Disabled in the BIOS Setup program.)
6. After the operating system loads the USB drivers, all legacy and non-legacy USB devices are recognized by the operating system, and Legacy USB support from the BIOS is no longer used.

To install an operating system that supports USB, verify that Legacy USB support in the BIOS Setup program is set to Enabled and follow the operating system's installation instructions.

3.5 BIOS Updates

The BIOS can be updated using either of the following utilities, which are available on the Intel World Wide Web site:

- Intel Express BIOS Update Utility, which enables automated updating while in the Windows environment. Using this utility, the BIOS can be updated from a file on a hard disk, a USB drive (a flash drive or a USB hard drive), or a CD-ROM, or from the file location on the Web.
- Intel® Flash Memory Update Utility, which requires booting from DOS. Using this utility, the BIOS can be updated from a file on a USB drive (a flash drive or a USB hard drive), or a USB CD-ROM drive.
- Intel F7 switch during POST allows a user to select where the BIOS .bio file is located and perform the update from that location/device.

All utilities verify that the updated BIOS matches the target system to prevent accidentally installing an incompatible BIOS.

NOTE

Review the instructions distributed with the upgrade utility before attempting a BIOS update.

For information about	Refer to
BIOS update utilities	http://www.intel.com/support/motherboards/desktop/sb/CS-035442.htm

3.5.1 Language Support

The BIOS Setup program and help messages are supported in US English. Check the Intel web site for support.

3.6 BIOS Recovery

It is unlikely that anything will interrupt a BIOS update; however, if an interruption occurs, the BIOS could be damaged. Table 8 lists the drives and media types that can and cannot be used for BIOS recovery. The BIOS recovery media does not need to be made bootable.

Table 8. Acceptable Drives/Media Types for BIOS Recovery

Media Type (Note)	Can be used for BIOS recovery?
Hard disk drive (connected to USB)	Yes
CD/DVD drive (connected to USB)	Yes
USB flash drive	Yes

NOTE

Supported file systems for BIOS recovery:

- *NTFS (sparse, compressed, or encrypted files are not supported)*
- *FAT32*
- *FAT16*
- *FAT12*
- *ISO 9660*

For information about	Refer to
BIOS recovery	http://www.intel.com/support/motherboards/desktop/sb/CS-035445.htm

3.7 Boot Options

In the BIOS Setup program, the user can choose to boot from local storage or a removable drive. The default setting is for the local storage to be the first boot device.

3.7.1 Booting Without Attached Devices

For use in embedded applications, the BIOS has been designed so that after passing the POST, the operating system loader is invoked even if the following devices are not present:

- Video display
- Keyboard
- Mouse

3.7.2 BIOS POST Hotkeys

The following hot keys are supported during boot.

[F2] Enter BIOS Setup

[F7] Update BIOS

[F8] Activate Windows Recovery Mode

[F10] Enter Boot Menu

3.7.3 Changing the Default Boot Device During POST

Pressing the <F10> key during POST causes a boot device menu to be displayed. This menu displays the list of available boot devices. Table 9 lists the boot device menu options.

Table 9. Boot Device Menu Options

Boot Device Menu Function Keys	Description
<↑> or <↓>	Selects a default boot device
<Enter>	Exits the menu, and boots from the selected device
<Esc>	Exits the menu and boots according to the boot priority defined through BIOS setup

3.7.4 Power Button Menu

The Power Button Menu is accessible via the following sequence:

1. System is in S4/S5 (not G3)
2. User pushes the power button and holds it down for approximately 3 seconds
3. Release immediately
4. User releases the power button before the 4-second shutdown override

If this boot path is taken, the BIOS will use default settings, ignoring settings in VPD where possible.

At the point where Setup Entry/Boot would be in the normal boot path, the BIOS will display the following prompt and wait for a keystroke:

[ESC] Normal Boot

[3] Reset Intel® AMT/Standard Manageability to default factory settings

[4] Clear Trusted Platform Module (Warning: Data encryption with the TPM will no longer be accessible if the TPM is cleared)

[F2] Intel BIOS

[F4] BIOS Recovery

[F7] Update BIOS

[F10] Enter Boot Menu

3.8 BIOS Error Messages

Table 10 lists the error messages and provides a brief description of each.

Table 10. BIOS Error Messages

Error Message	Explanation
CMOS Battery Low	The battery may be losing power. Replace the battery soon.
CMOS Checksum Bad	The CMOS checksum is incorrect. CMOS memory may have been corrupted. Run Setup to reset values.
No Boot Device Available	System did not find a device to boot.