Protectli Appliance

Protectli Vault Pro VP2420
4 Port 2.5G - Intel® J6412

January 27st, 2025

Overview

The Protectli Vault Pro series is characterized by the implementation of newer, more robust technologies than its predecessors. The VP2420 utilizes an Intel® Celeron® J series CPU (J6412), up to 32GB single-bank DDR4 memory, and 4x 2.5GbE Intel NICs, with NIC model variants i225-V or i226-V, depending on manufacturing date (see: External Interfaces). It includes connectors for both M.2 SATA and internally mounted 2.5" SATA drive memories, and keyed M.2 connectors for WiFi and LTE modules. Similar to most Protectli Vaults, the VP2420 includes multiple options for interfacing with the device, including HDMI and Display output ports with audio, a Type-C port with both input and display/audio output capabilities, a nano SIM slot, USB Micro-B console port, and two USB Type-A ports.

Protectli Vaults utilize Intel components ensuring persistent compatibility with a wide range of operating systems (OS) and applications. The VP2420 features a fanless, all-aluminum chassis design, allowing for efficient heat dissipation from the CPU and other components without any moving parts or additional power requirements.

Technical Specifications

Model	VP2420
Description	4x 2.5G Network Port Fanless Appliance
Processor	Intel® Celeron® J6412 (64 Bit, 2.0 GHz Base, 2.6 Burst, 1.5M Cache)
Processor Cores	4
Processor Threads	4
Intel® AES-NI	Supported
Virtualization	Intel® Vt-x, Vt-d
Network	4x Intel® I226-V 2.5G Ethernet, RJ-45
Video / Graphics	Intel® UHD Graphics for 10th Gen, 1x HDMI 1.4, 1x DP 1.4
Audio	Audio over HDMI, Type-C
Memory	1x SO-DIMM DDR4-3200, Max 32GB
Onboard Storage	1x M.2 SATA, 1x 16G eMMC on board
Optional Additional Storage	1x Internal 2.5” SATA 3.0 SSD
External I/O	4x RJ-45 Ethernet ports
	2x USB 3.2 Gen 2 Type-A
	1x USB 3.2 Gen 2 Type-C
	1x USB Micro 2.0 (Console)
	1x HDMI

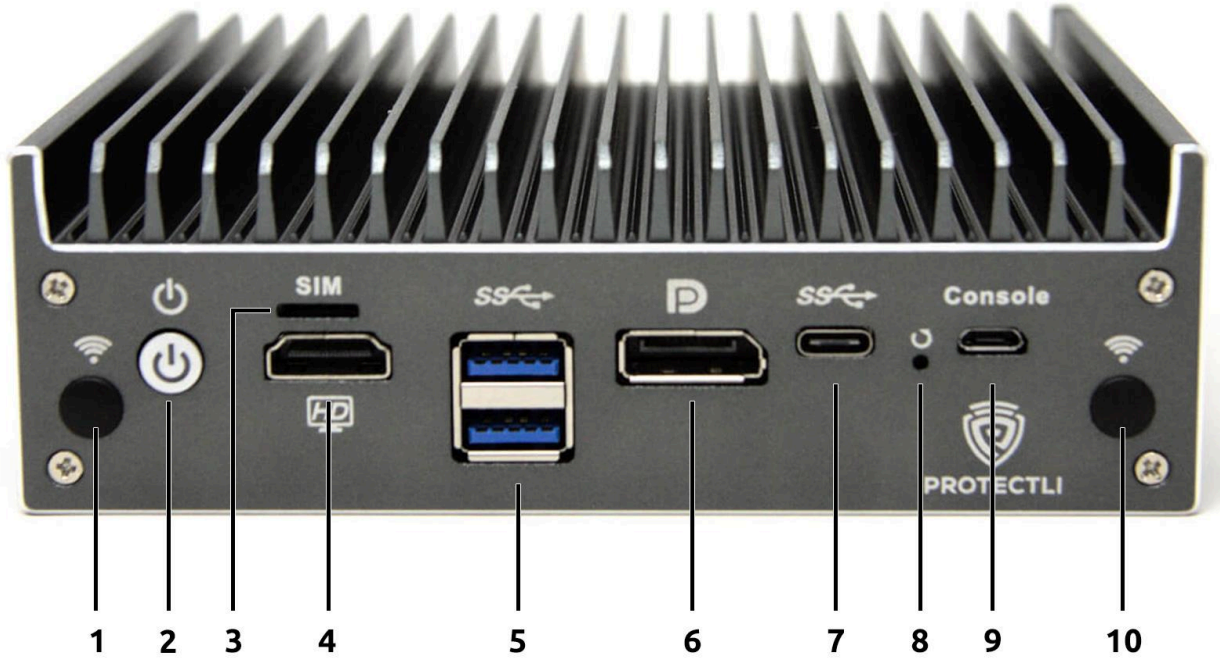
	1x DisplayPort 1.4
	1x Nano (4FF) SIM Holder
	6x WiFi/LTE Antenna Mounting Holes
	1x 12V DC Power Jack
Internal I/O	1x M.2 2280-M for SATA
	1x SATA Header, 1x SATA Power
	1x M.2 2230 Key E PCIe 3.0 x1 (WiFi)
	1x M.2 3052 (LTE)
	1x USB 2.0 Header
	1x Trusted Platform Module Header (9 pin)
	1x CMOS Reset (2 pin)
	1x CPU Fan Header (4 pin)
	1x Front Panel Header (9 pin)
Super I/O Chip	IT8613E
BIOS	AMI® or coreboot
Indicators	1x LED Power Button (Blue), 1x LED Power Indicator (Green), 1x LED Disk Activity Indicator (Red), 1x LED Disk Activity Indicator (Yellow)
Power	Input 12V DC, 1x DC Power Jack
Power Usage	Max 24W
Chassis	Fanless, Aluminum, Gray
Chassis Dimensions	5.75 x 5 x 2 in, 146 x 127 x 50 mm
Mounting Options	Desktop, VESA Bracket, Optional 1RU Rack Mount
Weight	1 lb 12 oz, .80 Kg
Shipping Weight	3 lbs 4 oz, 1.47 Kg
Operating Temperature	+14° - +122° F, -10° - +50° C
Operating Humidity	0 – 95% relative humidity, non-condensing
Approvals	UL (Power Supply), FCC Part 15 Class B, CE, RoHS
Country of Origin	Made in China, Assembled in USA, Canada, or Germany
Optional WiFi	1x M.2 2230 Key E PCIe 802.11ac/a/b/g/n (PCIe)

Included Accessories and Components

40W Power Supply with barrel connector
US/CA Power Cable *(Other regional power cables available)*
Micro-USB to USB-A Serial Console Cable
4x SSD mounting screws
1x SATA power cable
1x SATA data cable
4x M2 screws
VESA Bracket mount with hardware
Quick Start Guide

External Interfaces

Front Panel Configuration

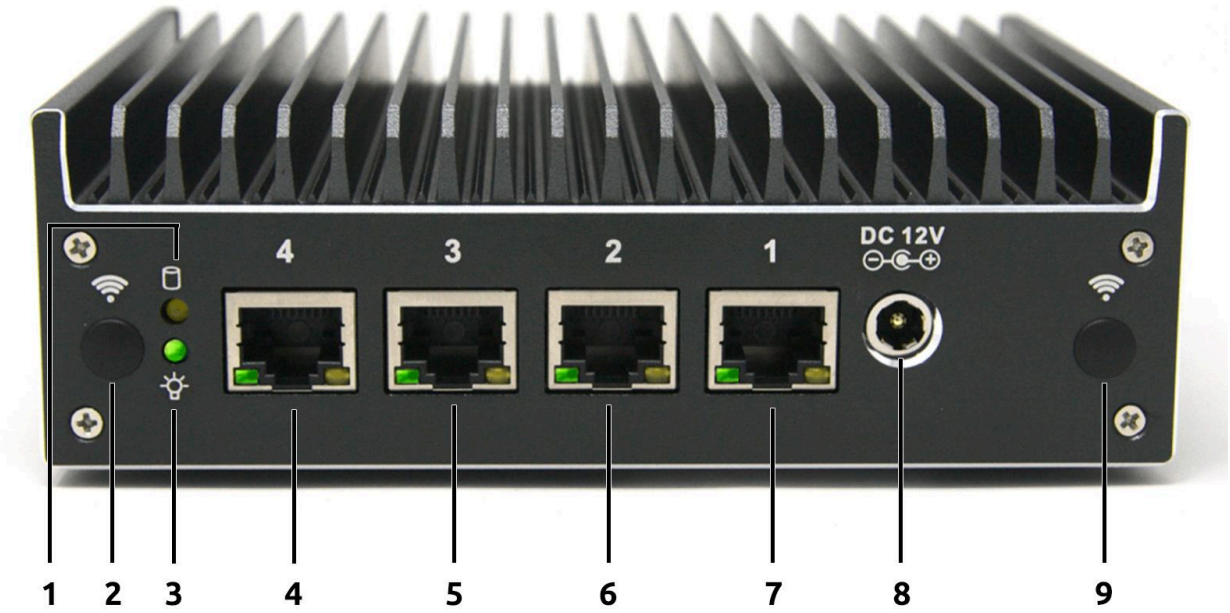


Item #	Object	Label	Description
1, 10	Antenna Ports		Two antenna ports for adding radio antennas (WiFi, LTE, etc.). The ports are covered by plugs while not in use.
2	Power Button		Pressing the Power Button will power the unit on and illuminate with a blue LED. *In OSes configured to handle ACPI signals, pressing the power button initiates a shutdown.* *Pressing and holding the Power Button for 5 seconds will force the unit to power off.*
3	SIM Slot	SIM	Nano SIM slot for providing a SIM card to an optional internal cellular modem.

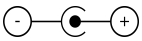
4	HDMI Connector	HD	Video and audio output via HDMI.
5	Two USB3 Connectors	SS	USB 3.2 Gen 2† Type-A connectors. (Theoretical maximum throughput of 10Gbps [~1.2GBps])
6	DisplayPort Connector		Video output via DisplayPort.
7	USB-C Connector	SS	USB 3.2 Gen 2† Type-C connector with Display Port. (Theoretical maximum throughput of 10Gbps [~1.2GBps]) Supports audio output when used as Display Port.
8	Reset Button (Recessed)		A momentary switch exposed via GPIO. This is not an ACPI reset button, but a general purpose button that may be programmed in the guest OS.
9	Serial Console Port	**Console**	RS-232 serial communications via UART exposed through USB 2.0 Type B Micro connector. Default port settings: • 115200 baud • No parity • 8 databits • 1 stopbit

†USB-IF naming standard for USB transfer rates: "USB 3.2 Gen 2" is the equivalent and current name for "USB 3.1 Gen 2" offering a theoretical maximum speed of 10 Gigabits (~1.2GB) per second. Older kernels and operating systems may not report the most recent naming convention. For a full linguistic deep dive, please see 3.1 and 3.2 Specification Language Usage Guidelines from USB-IF.
https://www.usb.org/sites/default/files/usb_3_2_language_product_and_packaging_guidelines_final.pdf,
https://www.usb.org/sites/default/files/usb_3_1_language_product_and_packaging_guidelines_final_0.pdf

Rear Panel Configuration



Item #	Object	Label	Description
1	HDD Activity LED		This amber LED will light up when data activity is detected on the SATA interfaces.
2, 9	Antenna Ports		Two antenna ports for adding radio antennas (WiFi, LTE, etc.). The ports are covered by plugs while not in use.
3	Power Indicator LED		This LED will stay solid green when the device is powered on.
4	Ethernet Port 4	**4**	The fourth 10/100/1000/2500 Mbps Intel® i225-V or i226-V†† ethernet port. [The left LED will illuminate solid Green at 2500/1000Mbps, and will be turned off when at 100/10Mbps]
5	Ethernet Port 3	**3**	The fourth 10/100/1000/2500 Mbps Intel® i225-V or i226-V†† ethernet port. [The left LED will illuminate solid Green at 2500/1000Mbps, and will be turned off when at

			100/10Mbps]
6	Ethernet Port 2	**2**	The fourth 10/100/1000/2500 Mbps Intel® i225-V or i226-V[††] ethernet port. [The left LED will illuminate solid Green at 2500/1000Mbps, and will be turned off when at 100/10Mbps]
7	Ethernet Port 1	**1**	The fourth 10/100/1000/2500 Mbps Intel® i225-V or i226-V[††] ethernet port. [The left LED will illuminate solid Green at 2500/1000Mbps, and will be turned off when at 100/10Mbps]
8	Power Supply Connector	**DC 12V** 	12V DC barrel connector for the 40W external power supply. Positive rail is the tip, negative is sleeve.

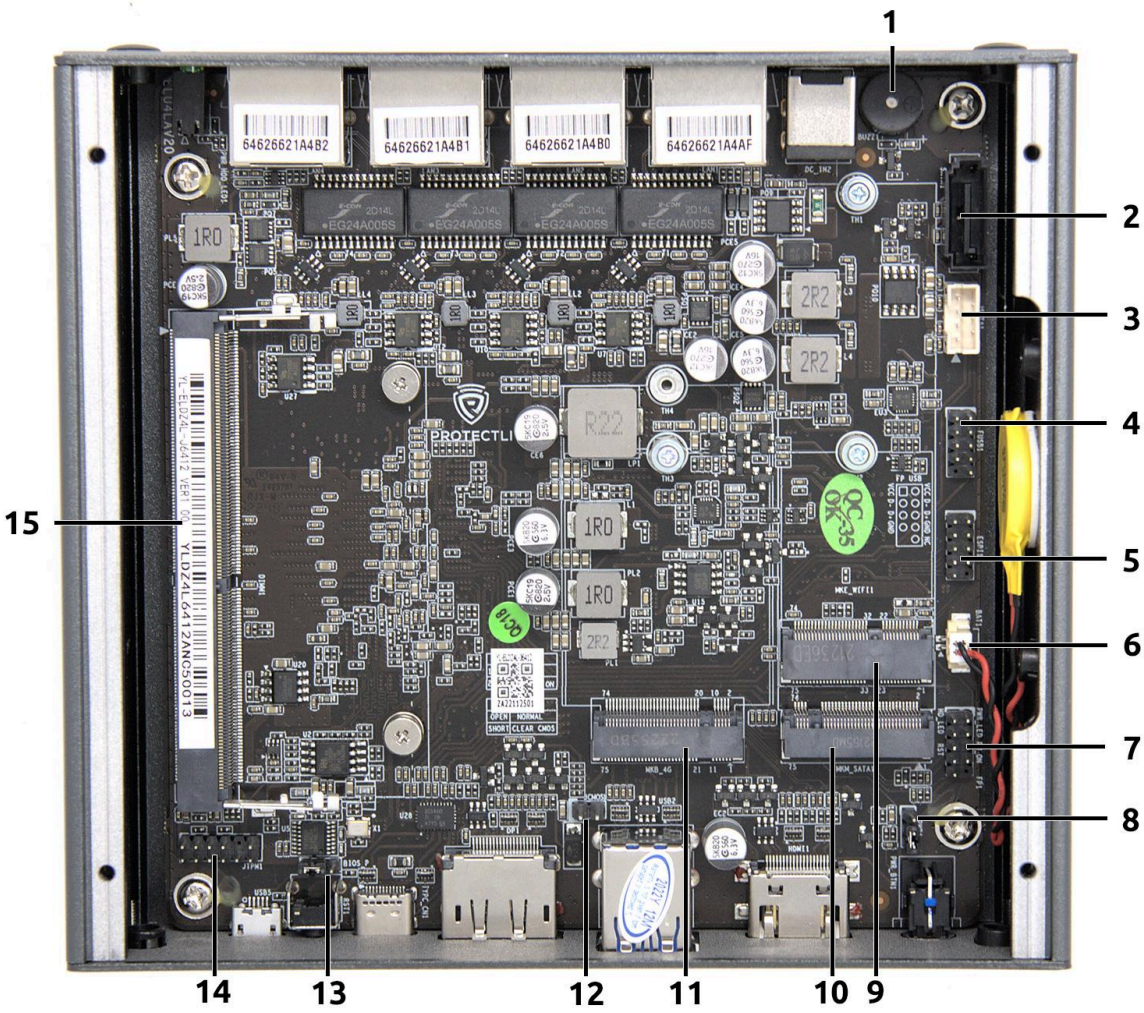
[††] The VP2420 will either contain 4x 2.5GbE Intel® i225-V or i226-V NICs depending on manufacturing date. VP2420 units manufactured after June of 2024 will contain i226-V NICs. Units manufactured before this time frame will contain i225-V NICs. Both of these NICs use the same igc driver within FreeBSD. Some operating systems like Windows may require a manual driver install to work properly. These drivers are available from Intel's website at: (https://www.intel.com/content/www/us/en/download/15084/intel-ethernet-adapter-complete-driver-pack.html)

Right Side Panel Features

Item #	Object	Description
1	Antenna Ports	Two antenna ports for adding radio antennas (such as WiFi). The ports are covered by plugs while not in use.

Internal Interfaces

Motherboard Top View



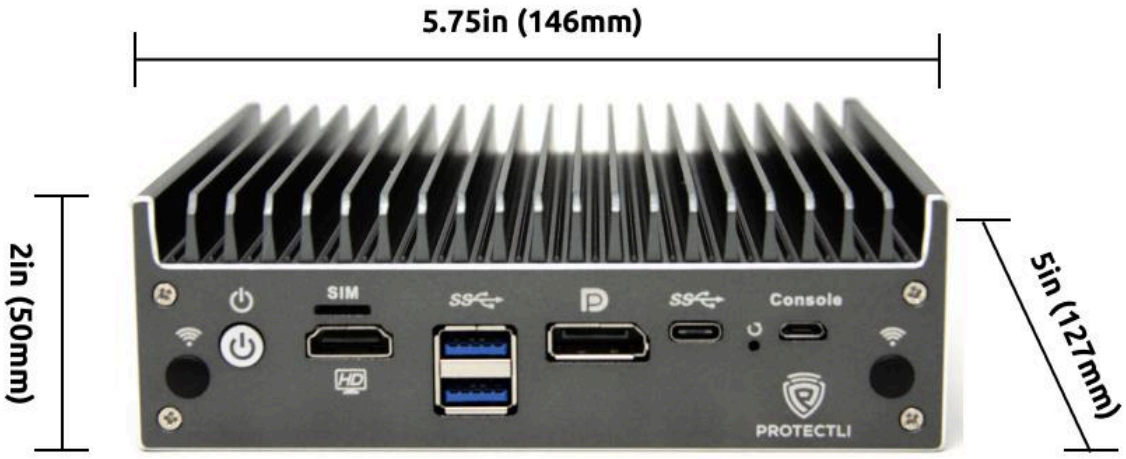
Item #	Object	Label	Description
1	Buzzer	BUZZ1	PC speaker. Produces “beep” sounds that may be utilized by system firmware or certain operating systems.
2	SATA Data Connector	SATA1	SATA III data connector. Recommended for additional storage, such as a 2.5” SATA SSD. (Standard 7-PIN SATA III Plug)

<table>
<tr><td>3</td><td>SATA Power Connector</td><td>JSATA1</td><td>SATA III power connector for additional storage. (1x4, 2.0mm pitch, JST PH style connector)</td></tr>
<tr><td>4</td><td>USB 2.0 Header</td><td>FUSB1</td><td>Internal header for additional USB 2.0 connections (2x5, pin 9 clipped, 2.00mm pitch).<table><tr><td>Pin 1: [+5V]</td><td>Pin 2: Empty</td></tr><tr><td>Pin 3: Negative data line for USB 2.0 on Port 4</td><td>Pin 4: Negative data line for USB 2.0 on Port 1</td></tr><tr><td>Pin 5: Positive data line for USB 2.0 on Port 4</td><td>Pin 6: Positive data line for USB 2.0 on Port 1</td></tr><tr><td>Pin 7: GND</td><td>Pin 8: Empty</td></tr><tr><td>X</td><td>Pin 10: Empty</td></tr></table></td></tr>
<tr><td>5</td><td>eSPI Header</td><td>ESPI1</td><td>eSPI Header for eSPI peripherals. (2x5, pin 10 clipped, 2.00mm pitch).<table><tr><td>Pin 1: [+3.3V]</td><td>Pin 2: ESPI_RST_N</td></tr><tr><td>Pin 3: ESPI_CLK</td><td>Pin 4: ESPI_IO_0</td></tr><tr><td>Pin 5: ESPI_CS0_N</td><td>Pin 6: ESPI_IO_1</td></tr><tr><td>Pin 7: ESPI_IO_3</td><td>Pin 8: ESPI_IO_2</td></tr><tr><td>Pin 9: GND</td><td>X</td></tr></table></td></tr>
<tr><td>6</td><td>CMOS Battery Header</td><td>BAT1</td><td>3V CR2032 connected via 2-pin connector (1.25mm pitch).</td></tr>
<tr><td>7</td><td>Front Panel Header</td><td>FP1</td><td>Internal header for adding external device controls and indicators featured through the front panel, such as power button, reset button, activity LEDs, etc (2x5, Pin 10 clipped, 2.00mm pitch).<table><tr><td>Pin 1: [+3.3V]</td><td>Pin 2: [+5V]</td></tr><tr><td>Pin 3: SYS_Reset</td><td>Pin 4: GND</td></tr><tr><td>Pin 5: GND</td><td>Pin 6: PWR_BTN</td></tr><tr><td>Pin 7: SATA_LED</td><td>Pin 8: GND</td></tr><tr><td>Pin 9: GND</td><td>X</td></tr></table></td></tr>
</table>

8	Power Restore Jumper	JPWR1	Jumper setting determines system state after power loss. Based on the orientation in the image above, the **default location** for the jumper is on the **bottom and middle pins**. AMI firmware settings allow for the ability to change the behavior of this jumper. Within AMI settings, navigate to **Advanced>System Power Management** to change the value of **Restore On AC Power Loss** between **Power On** and **Power Off**. When set to **Power On**, the location of the jumper on the pins will not affect behavior and the unit will always attempt to power on after power loss. When set to **Power Off**, the default jumper position will override the AMI settings and the unit will continue to power on after power loss. When set to **Power Off** and the jumper is on the top and middle pins, the unit will remain off after a power loss. Introduced in **coreboot 1.2.1**: In the firmware menu at **Dasharo System Features>Power Management Options**, Power State After Power Loss can be set to Power off or Power On. When set to **Power Off** while the jumper is on the top and middle pins, the unit will **not** automatically attempt to power back on when power is lost. When set to **Power On**, the jumper location will not affect the behavior and the unit will always attempt to power back on after power loss. When jumper is in the default location, the unit will always attempt to power back on after power loss regardless of setting.
9	PCI WiFi Expansion Slot	MKE_WIFI1	Connector provides PCIe 3.0 x1 over a 2230 M.2 E-keyed slot. Designed for Protectli WiFI cards, but is not limited in its capabilities.
10	M.2 Storage Connector	MKM_SATA 1	Connector for a 2280 M.2 M-keyed SATA 3.0 storage device, such as an M.2 SATA SSD. ***Not compatible with NVMe storage technology***.
11	USB LTE Expansion Slot	MKB_4G	Connector provides USB 2.0 over an M.2 B-keyed slot. Designed for Protectli LTE modems, but is not limited in its capabilities.
12	NVRAM Reset Jumper	JCMOS1	Shorting this jumper while the CMOS battery is connected will reset the BIOS NVRAM.
13	BIOS Write Protection	BIOS_P	Jumper setting enables BIOS flash write protection. Shorting the two pins nearest the TPM Header (diagram item #14) disables write protection. Shorting the two pins furthest from the same TPM Header will prevent write operations to the BIOS. *In order to flash newer or different*

<table>
<tr><td></td><td></td><td></td><td>BIOS (such as switching from AMI to coreboot), BIOS Write Protection must be disabled.</td></tr>
<tr><td>14</td><td>TPM Header</td><td>JTPM1</td><td>Trusted Platform Module header for TPM2.0 hardware devices. (2x6, pin 10 clipped, 2.0mm pitch)
<table>
<tr><td>Pin 1: VDD</td><td>Pin 2: TPM_CS#</td></tr>
<tr><td>Pin 3: SPI_MISO</td><td>Pin 4: SPI_MOSI</td></tr>
<tr><td>Pin 5: NC1</td><td>Pin 6: SPI_CLK</td></tr>
<tr><td>Pin 7: GND</td><td>Pin 8: SPI_REST</td></tr>
<tr><td>Pin 9: NC2</td><td>X</td></tr>
<tr><td>Pin 11: NC3</td><td>Pin 12: TPM_PIRQ#</td></tr>
</table></td></tr>
<tr><td>15</td><td>Memory Slot</td><td>DIMM1</td><td>DDR4 SODIMM.</td></tr>
</table>

Dimensions View



Document History

2025-01-15
- Added information regarding LED behavior for NICs
- Added USB speed notes for USB ports
- Added additional info to BUZZ1
- Added pin count, pitch, and connector type for SATA1
- Added connector type for JSATA1
- Added pin count, pitch, and layout for FUSB1
- Added pin count, pitch, and layout for ESPI1
- Added pin count, pitch, and layout for FP1
- Added additional information to JPWR1 header, including support for coreboot version 1.2.1
- Added more info to MKM_SATA1
- Added pin count, pitch, and layout for JTPM1
- Added image for side view

2024-08-01
- Changed “PC Speaker” to “PC speaker”
- Changed ”RS232” to “RS-232”
- Removed “TPM1.2” from section “Motherboard Top View”
- Updated linked spec sheet with ® and ™ as necessary for Intel and AMI
- Updated linked spec sheet from “4FF SIM” to “Nano (4FF) SIM”

2024-06-28
- Clarified PCI and USB specifications such as speed, protocol, etc.

2024-05-17
- Clarified LTE and/or WiFi slot naming schemes

2024-04-01
- Fix incorrectly stated chassis DC power connector (removed screw-in threading reference).
- Moved “Right Features” section to before “Motherboard Top View” in cohesion with other datasheets.

2024-02-23
- Fix discrepancy where the USB Type-C connector was mislabeled as “3.0” instead of the correct “3.2”.

2023-08-31
- Fix incorrectly stated chassis color (black => gray).
- Clarify details about the i225-V network interfaces.

2023-05-01
- Fix incorrectly stated maximum DIMM size (16GB => 32GB)

2023-03-21
- Initial document