5 best single-board x86 computers in 2023

Although ARM-based single-board computers are more common, x86 SBCs still have their place.

In general, they are generally more efficient and can be used in applications that care less about power consumption than performance, such as emulators and server hosting.

LattePanda 3 Delta

The LattePanda 3 Delta is a powerful single-board computer capable of running Windows and Linux. It is slightly larger than the Raspberry Pi 4 and has a quad-core processor nested under a built-in heatsink and fan.

In true SBC fashion, you're almost spoiled for choice with the input/output connections offered by this board. The LattePanda Delta 3 contains an Arduino Leonardo ATMEGA32U4 coprocessor that can be connected to electronics via the onboard GPIO pins and also comes with an RTC pin to power the RTC.

Processor	Intel Celeron N5105 is capable of running at clock speeds from 2.0GHz to around 2.9GHz
GPU	Intel UHD Graphics (frequency 450 to 800 MHz)
RAM	LPDDR4 8GB 2933MHz
Memory	64GB eMMC V5.1, microSD card slot
Gate	1 x USB-C (Power Delivery only), 1 x USB-C (3.1, Display Port 1.4 and Power Delivery), 1 x HDMI 2.1 (8K@60Hz)
Expansion slot	1 x M.2 M, 1 x M.2 M
Network connections	WiFi 6, Bluetooth 5.2, Intel Gigabit Ethernet

Coprocessor	ATMEGA32U4
Other features	3 MIPI CSI connectors, 2 MIPI DSI connectors, 2 30-pin GPIO expansion connectors
Source	USB-C Power Delivery 12V 2A (24W)
Price	$279 (not active), $339 (with Windows License)

Android H3+

The Odroid H3+ is one of the few x86 products from the Hardkernel and seeks to replace the older H2. It comes with an Intel quad-core processor with a boost clock speed of 3.3GHz and supports up to 64GB of DDR4 RAM in dual-channel mode and is housed in SODIMM slots. The integrated graphics card is clocked at 900MHz and the RTC battery is included with the board.

The Odroid H3+ has a built-in heatsink and also has a 4-pin fan connector if your project needs active cooling. There is no wireless network module on this board, but it does have two Gigabit Ethernet ports on board.

Processor	Intel Celeron N6005 (up to 3.3Ghz)
GPU	Intel UHD Graphics (24/32 EU up to 900MHz)
RAM	2 DDR4 SO-DIMM slots, dual-channel memory support, up to 64GB
Memory	eMMC socket, microSD card slot
Ports & Expansion Slots	2 x USB 3.0, 2 x USB 2.0, 1 x HDMI 2.0 (up to 4K@60Hz), 1 x DisplayPort 1.2 (up to 4K@60Hz), 1 x audio input, 1 x audio output, 2 x SATA 3.0 Port, 1 x PCIe 3.0 (4 lanes)
Network connections	2 x Gigabit Ethernet
Other features	24-pin GPIO expansion connector, 5 x system LED indicators, passive heatsink, Power and reset buttons
Source	DC 14V ~ 20V (len to 60W) via power jack
Price	$165.00 (without power supply)

Up Squared V2

Up Squared V2 is the 2022 release by the UPboard company and is intended to be the successor to the UP Squared series. There are two versions, each based on a different SoC (System-on-Chip), one using the Intel Pentium J6426 processor and the other using the Intel Celeron N6210 (formerly Elkhart Lake) .

It has a 40-pin GPIO expansion header and comes with a passive heatsink and an onboard RTC pin. It is larger than the Raspberry Pi 4B, 85.6 mm long and 90 mm wide. This x86 board is still compact and portable enough for embedded projects. In addition, the power consumption ratio is relatively low compared to the performance it delivers.

Up Squared V2 is also suitable for industrial applications with standard 12V DC power input and hardware TPM v2.0 module. It is also capable of displaying 4K content at 60Hz on 3 screens at the same time.

Processor	Intel Celeron N6210 (up to 2.6 GHz), Intel® Pentium® J6426 (up to 3.0 GHz)
GPU	Intel UHD Graphics
RAM	2GB, 4GB, 8GB, 16GB
Memory	32GB or 64GB eMMC memory
Ports & Expansion Slots	2 x USB 2.0, 3 x USB 3.2 Gen 2 Type-A, 1 x HDMI 1.4b, 1 x DP 1.2, 1 x M.2 2230 E, 1 x M.2 2280 M
Network connections	2 x Gigabit Ethernet

Other features	40-pin GPIO expansion header, passive heatsink, RTC battery, 2.0 . TPM
Source	12V DC @ 5A via power jack
Price	$179 - $359 (tax excluded)

UDOO Bolt V8

The UDOO Bolt V8 is not a single-board computer in the strictest sense of the term, as it houses the RAM sticks in SODIMM slots rather than directly on the board. It is more accurately called a maker board, as there are so many connectivity options built into the slim chassis.

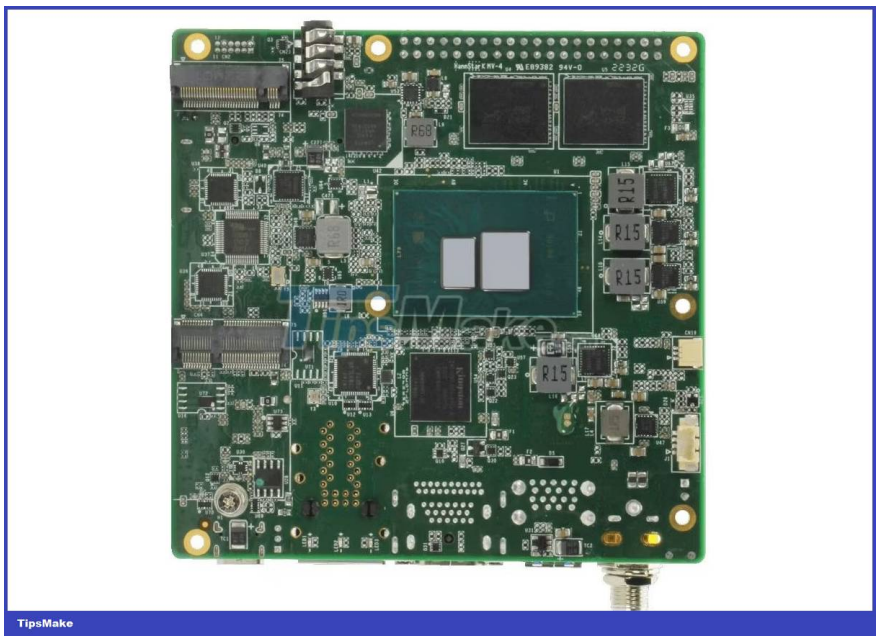
It comes with an AMD Ryzen Embedded V1605B processor with 4 cores and 8 threads, capable of running at 2GHz normally and 3.6GHz on boost. It has the same coprocessor as the LattePanda 3 and the Arduino ATMEGA32U4.

The UDOO Bolt V8 is an expensive board for over $500, plus taxes and shipping. You can also buy the slightly weaker UDOO Bolt V3 for about $100 less.

Processor	AMD Ryzen Embedded V1605B, quad core/eight threads @2GHz (3.6GHz Boost)
GPU	AMD Radeon Vega 8 Graphics (8 GPU compute units)
RAM	2 x DDR4 SO-DIMMs, dual channel, support up to 32GB
Memory	32GB EMMC 5.0" high-speed drive
Ports & Expansion Slots	2 x USB 3.0 Type-A, 2 x USB Type-C, 2 x HDMI 1.4/2.0A, 1 x M.2 Socket 2 Key B for SATA SSD modules, 1 x M.2 Socket 3 Key M for NVMe . modules
Network connections	Gigabit Ethernet
Coprocessor	ATMEGA32U4

Other features	40-pin GPIO expansion header, passive heatsink and fan controller, RTC . battery
Source	19V @5A DC via power jack, USB Type-C Power Delivery
Price	$550

Up Squared Pro 7000



The Up Squared Pro 7000 is an Intel-based single-board computer released in early 2023. It is the latest addition to the Up Squared Pro series and features a number of upgrades, such as a more powerful processor, card Better graphics, more ports and extended interfaces.

There are 4 possible options for the integrated SoC, Intel N50, Intel N97, Intel Atom x7425E or IntelCore i3-N305. All of these models vary in performance and price, with the Intel N50 being the cheapest and the Core i3 being the most expensive. Regardless, all models are designed to consume as little power as possible while delivering maximum performance.

The Up Squared Pro 7000 is aimed at professional manufacturers and has hardware optimized for robotics, automation, Internet of Things, and artificial intelligence applications.

Processor	Intel Core i3-N305, Intel Atom x7425E, Intel N97 Processor or Intel N50 Processor

GPU	Intel UHD Graphics Gen 12
RAM	Up to 16GB LPDDR5
Memory	Up to 64GB eMMC
Ports & Expansion Slots	2 x USB 2.0, 2 x USB 3.2 Gen 2 Type-A, 1 x USB 3.2 Gen 2 Type-C, 1 x HDMI 2.0, 1 x DP 1.2, 1 x M.2 2230 E-key, 1x M.2 2280 M-key, 1 x M.2 3052 B-key
Network connections	2 Gigabit Ethernet ports
Other features	40-pin GPIO expansion header, passive heatsink, timer, RTC battery, 2.0 . TPM
Source	12V DC @ 6A via power jack
Price	$227 - $449 (tax excluded)