

ZimaBoard 2 Windows testing:

First Zima Board 2 DOES NOT have all the hardware to run Windows 11 and it DOES NOT come with a Windows Licence. There are means to circumvent these which while appearing to work will not result in a valid licenced install.

A future Microsoft update ,may remove any software hacks or fixes, leading to future issues, or even rendering the Operating System inoperable. If you choose to use these methods, the reader needs to accept that in doing so they accept all risk. This document will not cover any procedures to bypass Microsoft licencing, staying with the “Demo”/ un-activated versions of Windows that will be wiped after testing.

ZimaBoard2 Specifications:

Note this testing was done on an engineering sample, and while unlikely there may be minor changes to the initial production version. IceWhale may also need to change the specification from this depending on component supply and cost issues.

This test is using the eMMC onboard, in most cases people would use a SATA SSD but this was to test the hardware as is.

	ZimaBoard 2	Windows 11 Minimum	Server 2025
CPU	N150	Pass	Pass
RAM	8GB	4GB	4GB
Storage	32GB	64GB ¹	32GB
Video	Intel Embedded	1280 x 720 8Bit or greater	Optional
NIC	Intel i226V x2	Must be present	Optional
Audio	None	Optional	Optional
TPM		TPM 2.0 or greater	Optional

Note: ¹ Microsoft will not licence a vendor to put an OEM Windows licence on a computer that has less that 64GB of storage. However, Windows will only use about 20GB after install, so it possible to install windows on system with less than 64GB of storage, despite what Microsoft minimum specification say.

Remember these are the minimum requirements of the OS, in most cases you will need to add more software on top which will further extent the minimum requirements.

Tools Used:

- **PRE PRODUCTION – ENGINEERING SAMPLE** - ZimaBoard 2 **832** Sample
- Rufus - The Reliable USB Formatting Utility - Version 4.7 (Build 2231)
 - To get around the hardware requirements only Rufus was set to remove the need for 4GB RAM, Secure Boot and TPM 2.0.
- Win11_24H2_EnglishInternational_x64.iso
- Generic USB Flash drive (32GB –recognised as a generic Silicon Motion device)

Process:

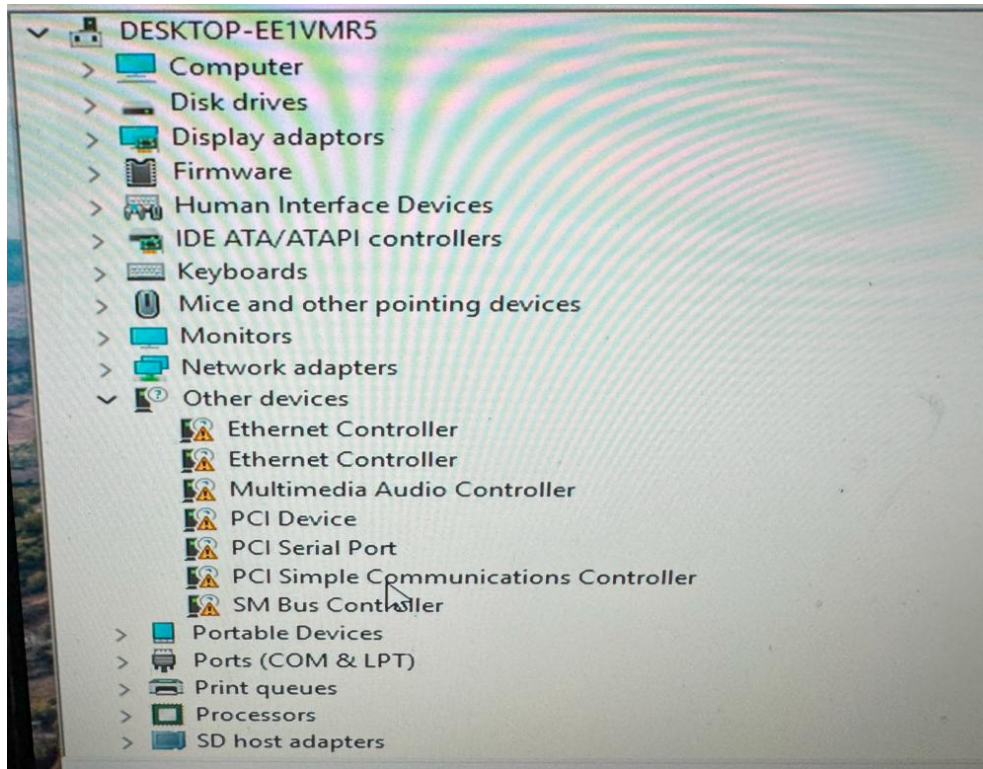
Rufus was used to image the W11 install to the USB, the USB set was run by triggering a onetime boot from USB.

The install ran as expected however at the part where you need to select a disk (this was to the eMMC) The installer seemed to miss a beat and error, and it took a few more clicks than usual to wipe the existing ZimaOS install. With hindsight the author should, have wiped the eMMC so it was clean but despite warning me that Windows needed more space than was there (saying it needed 64GB) the installer continued as expected.

Windows 11 Pro was specified as the OS, selecting the “I do not have a key” with the intention to test and then erase this after a few day or so, so licencing was not a concern at this time, it was expected that the test would be completed in the Windows grace period.

Once install Windows booted as normal and the overall process took no more than 10 minutes.

The first issue was lack of drivers, Windows did not identify the NIC correctly, and the Intel drivers were added via a USB stick. This mean no other drivers could be loaded and the display was a simple VGA type resolution display.



Once the Intel Driver were loaded for this the “**Intel® Network Adapter Driver for Microsoft Windows 11**” was downloaded an expanded to a USB, the individual NICs were then updated to avoid loading too much if the intel package. The Intel Driver package runs to almost 900MB so it was avoided to avoid running out of space on the eMMC.

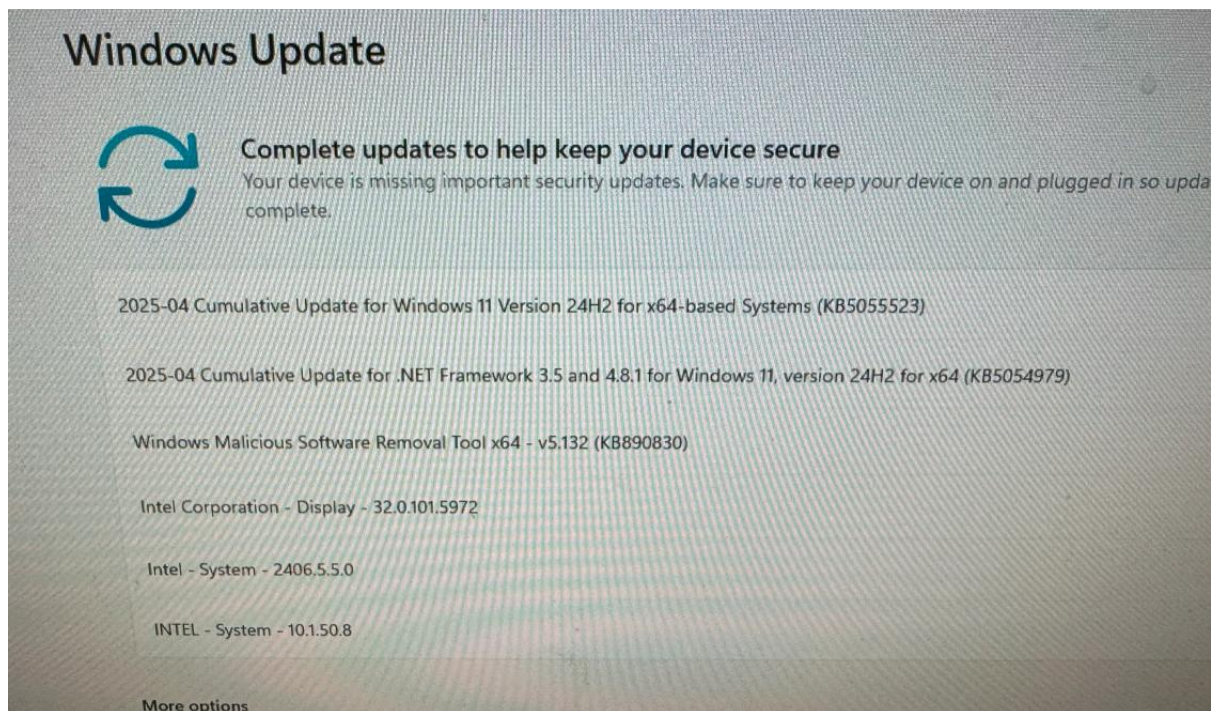
After the drivers for the two nice were installed but right clicking the NIC in Device manager and pointing the installer to the expanded drivers, the drivers installed. and the author proceeded to do a Windows update. Windows them correctly installed chipset and video drivers and identifying most of the unknown components on the device.



Driver Source: Intel – Intel ID 15084 Version 30.0.1 (Latest at time of writing)

<https://www.intel.com/content/www/us/en/download/15084/intel-ethernet-adapter-complete-driver-pack.html>

Two components remained undetected a Multimedia Audio controller VID 8086 & PID 54C8 and a PCI Serial port. VID 8086 & PID 54FC. These will be discussed in a few paragraphs.



Windows needed a reboot after the Windows update, and then a 2nd reboot after as 2nd update and much to this authors surprise Windows was in an activated state. No 3rd party tool or hack for activation were used as a workaround, Windows simply activated itself with a digital licence.

Microsoft do not release any details about the changes to Activation so how long this may work with Microsoft is an unknown, a similar process worked for a long time under Windows 10.

The Intel Video Driver was detected and a better resolution setup.

Missing Drivers

Of the two components missing the VID of 8086 is assigned to Intel. Neither PID (54C8 or PID 54FC) appear to be easily searchable.

Audio Device - VID 8086 & PID 54C8

This is most likely the inbuilt Intel High Definition Audio device; however, the Intel Driver assistant did not install any driver for it. Intel do not provide hardware direct to end users so usually any driver needs to be supplied by the chipset maker, however Intel do supply “reference” drivers, that almost always work. These have the advantage that they are usually not bloated by the maker to add other feature or OEM log’s.

Intel list is as Intel® High Definition Audio (Intel®HD Audio) (Audio, Voice, Speech). This turned out not to be an Intel Driver that was needed but a Realtek driver, and was the **“Realtek* High Definition Audio driver for Windows® 10 64-bit for NUC6CAY”** on Intels Site, or the driver inside the **“Driver Pack for the Intel® NUC M15 Laptop Kit - LAPRC710 & LAPRC510”**, (Version 3.0) specifically the **“7_ISH-Win11-3.1.0.4594”** were suitable.

PCI Serial port.

VID 8086 & PID 54F. This look to be the Integrated Sensor Hub by Intel. Intel only provide driver for selected system for this, and it was again found that the driver inside the **“Driver Pack for the Intel® NUC M15 Laptop Kit - LAPRC710 & LAPRC510”**, specifically the **“7_ISH-Win11-3.1.0.4594”** was suitable.

Running Passware

Passware is a relatively simple process, the executable is downloaded installed and ran. The tests are automated and take 10 to 15 minutes to run. The exact timing was not noted as it was left to execute

Passware resuce can be found here -

<https://www.passmark.com/baselines/V11/display.php?id=258804916055> and the results are shown in the Appendix.

Conclusion.

The Preproduction 832 ZimaBoard 2 this was testing on is quite capable of running Windows 11 The N150 chipset and 8GB of memory was fast enough for light general purpose / internet use.

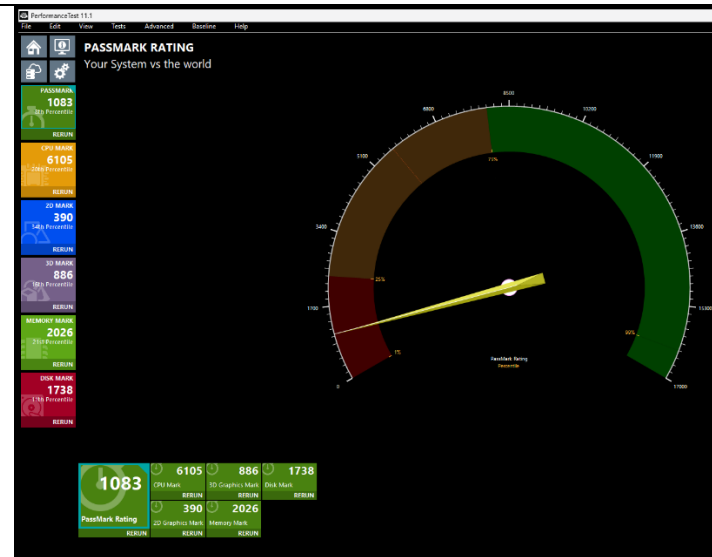
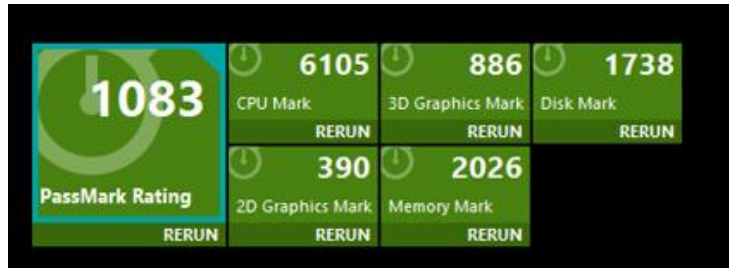
However is not recommended to set up a windows install for general purpose use using on the 32GB eMMC. The main issue is the 32GB eMMC memory is not enough for Windows and then the downloads needed by Windows Update.

Its important to remember that Windows is only the OS, in most cases the end user will install more software to work on, such as an office tools type product or digital signage tools. This will mean that the eMMC will be fully used in very short time. There are tools to slim down the Windows install, such as Tiny11 but in most cases the better solution is to use a small SSD and bypass the eMMC if this is to be a general-purpose device. I more cases the suer downloading update, software, and so on will fill the eMMC quickly. If the Zima Blade 2 is used to run something like Digital Signage, where the OS and Software are likely to be relatively constant in terms of disk space use, the eMMC would be an valid option.

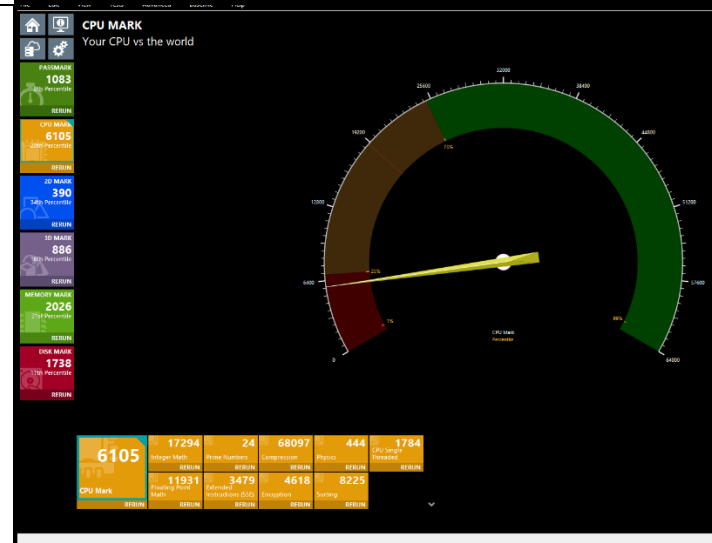
Production 1664 variants may be fine however as this was mainly testing for hardware detection and pass mark scores this was not explored as its not yet available.

Passmark Images;'

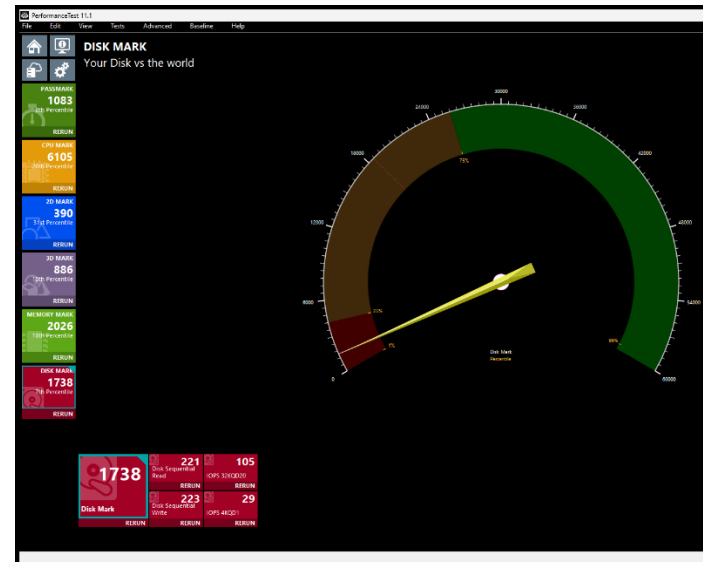
Overall Score



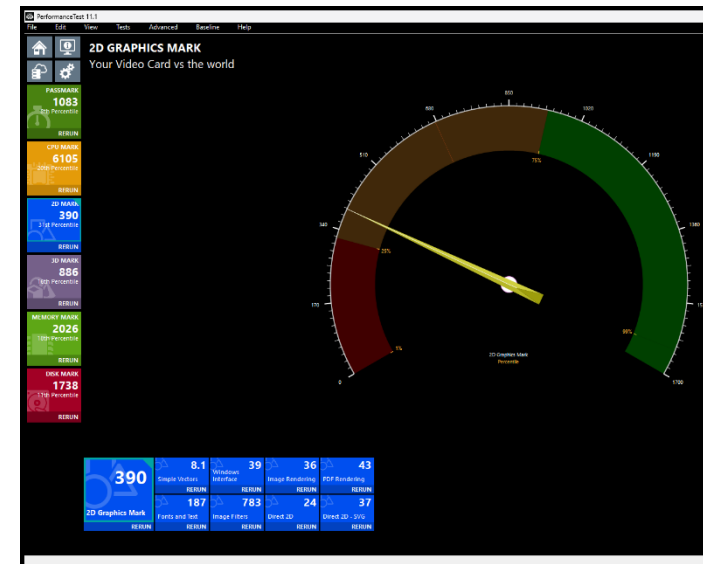
CPU



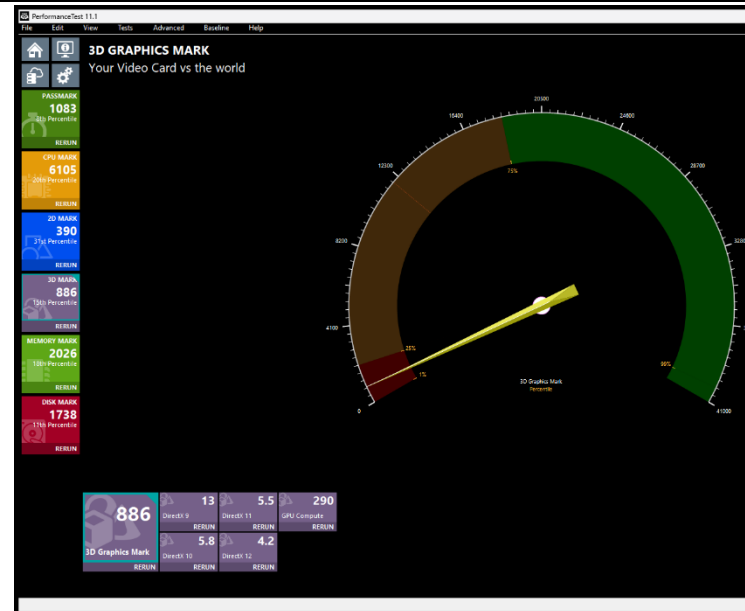
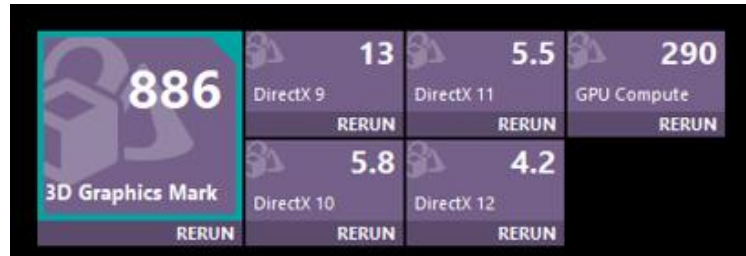
Disk



2D Graphics



3d Graphics



Text report

PassMark(R) PerformanceTest 11.1 (<https://www.passmark.com>)

Results generated on: 28 April 2025

Number of processes used for CPU Tests: 4

Benchmark Results

Test Name	This Computer
Integer Math (MOps./Sec.)	17294.5 (16%)
Floating Point Math (MOps./Sec.)	11931.4 (20%)
Prime Numbers (Million Primes/Sec.)	24.3 (20%)
Extended Instructions (SSE) (Mill. Matrices/Sec.)	3479.8 (13%)
Compression (KBytes/Sec.)	68097.3 (15%)
Encryption (MBytes/Sec.)	4618.4 (40%)
Physics (Frames/Sec.)	444.3 (22%)
Sorting (Thousand Strings/Sec.)	8225.7 (12%)
CPU Single Threaded (MOps./Sec.)	1784.3 (13%)
Cross-platform Mark (Composite average)	10545.9 (18%)
Gaming Score (Composite average)	1156.7 (-1%)
Simple Vectors (Thousand Vectors/Sec.)	8.1 (21%)
Fonts and Text (Ops./Sec.)	187.3 (28%)
Windows Interface (Ops./Sec.)	39.8 (28%)
Image Filters (Filters/Sec)	783.5 (35%)
Image Rendering (Thousand Images/Sec)	36.1 (33%)
Direct 2D (Frames/Sec.)	24.2 (20%)
PDF Rendering (Ops./Sec.)	43.8 (24%)
Direct 2D - SVG (Frames/Sec.)	38.0 (20%)
DirectX 9 (Frames/Sec.)	13.1 (9%)
DirectX 10 (Frames/Sec.)	5.8 (13%)
DirectX 11 (Frames/Sec.)	5.5 (8%)
DirectX 12 (Frames/Sec.)	4.2 (12%)
GPU Compute (Ops./Sec.)	290.3 (13%)
Database Operations (KOps./Sec.)	2545.5 (26%)
Memory Read Cached (MBytes/Sec.)	16455.2 (8%)
Memory Read Uncached (MBytes/Sec.)	11195.0 (14%)
Memory Write (MBytes/Sec.)	8256.7 (23%)
Available RAM (Megabytes)	4195.2 (14%)
Memory Latency (ns (lower is better))	35.1 (20%)
Memory Threaded (MBytes/Sec.)	26000.5 (31%)
Disk Sequential Read (MBytes/Sec.)	221.1 (8%)
Disk Sequential Write (MBytes/Sec.)	223.6 (17%)

IOPS 32KQD20 (MBytes/Sec.)	105.7 (11%)
IOPS 4KQD1 (MBytes/Sec.)	29.2 (24%)
CPU Mark (Composite average)	6105.5 (20%)
2D Graphics Mark (Composite average)	390.2 (31%)
Memory Mark (Composite average)	2026.4 (18%)
Disk Mark (Composite average)	1738.8 (7%)
3D Graphics Mark (Composite average)	886.4 (15%)
PassMark Rating (Composite average)	1083.4 (8%)
Operating System	Windows 11 Professional Edition build 26100 (64-bit)
CPU Type	Intel N150
Number of CPUs	1
Cores per CPU	4
Hyperthreading	Disabled
Motherboard	Default string
Memory	8GB RAM
Videocard	Intel(R) Graphics
Hard Drive	Generic C9A551 (31GB)
Hard Drive	SanDisk Ultra USB Device (15GB)