MINISFORUM

GN31

Introduction Presentation Rev 1.0, May 2019

About MinisForum

- Founded in 2015, MinisForum is a group of electronics enthusiasts and computer engineers, aiming to become one of the leading computer companies in the world.
- To achieve this goal, MinisForum has been designing and developing interesting products, delivering them to cusumers at a reasonable price, providing consumers with unparalleled satisfaction and reliability through these products.
- GN31 MINI PC with Intel Celeron J3160(1.6GHz) is designed and released by MinisForum, targeting the use of small business, industrial automatic control, home theater and living room. It's very low power consumption and a great savings on electric bill.

Features fo GN31

- Small size, beautiful appearance
- TDP Unlocker
- Superb heatpipe cooling system
- Equipped with PCI-E M.2 2280 SSD for faster and more stable storage.
- HDMI / VGA output display
- Input/Output strong scalability



Small size, beautiful appearance

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Measures 120 x 120 x 36 mm Weighs less than a kilogram.

Ventilation gridlles on the sides and bottom



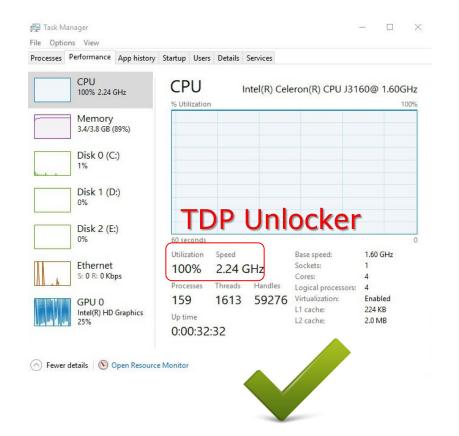
TDP Unlocker

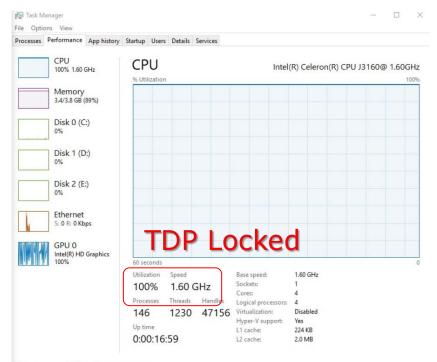
- 6W TDP limits the performance of Intel Celeron J3160 processors
- Frequencies (CPU/GPU) drop whenever TDP reaches 6W
- TDP unlocker increases the TDP threshold
- TDP unlocker enhances system performances by avoiding underclocking instead of over-clocking, thus 100% safe
- Performance can be +60% better than competitions with the same processor which
- Pre-requiste :GOOD COOLING is required to handle the extra power
- Minisform team designed a cooling system to solve this problem.
 (Please refer to page 8-9 for system operating temperature test results.)

TDP Unlocker



- TDP Locked CPU max speed 1.6GHz
- TDP Unlocker CPU max speed 2.24GHz





○ Fewer details Source Monitor

- Extreme silent operation at 100% CPU load
- Effectively dissipates heat out of the casing
- Design ready to handle 9W TDP CPU
- Heat sink with Centrifugal(Blower) Fan

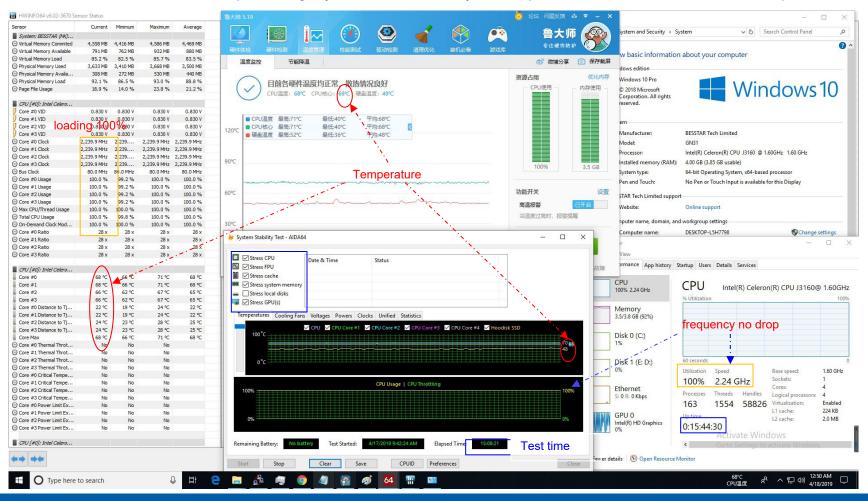






MINIS FORUM

 AIDA64 test : Stress CPU/GPU/Mem..... load 100% monitoring for 15 hours, temperature is maintained at about 70 degrees.
 In this case the frequency (CPU / GPU) still performs best, no drop.

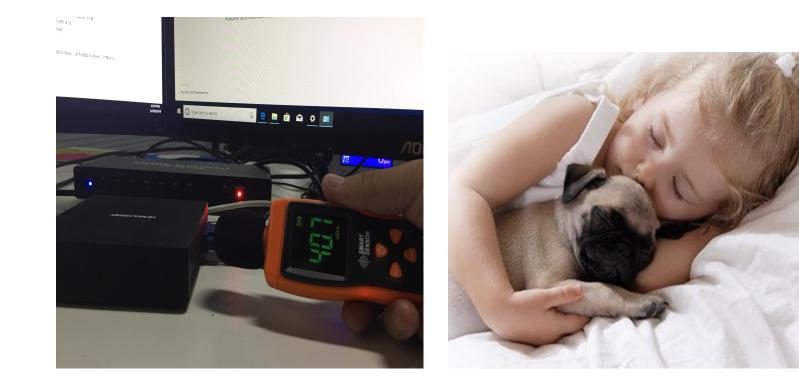


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Online 4K video play CPU temperature is about 50 degrees

| $\leftarrow \rightarrow C$ in htt | tps://www.you | tube.com/ | watch?v=Rk | 1K2bCq4J8 | | | Stress CPU | Date & Time | Status | | Intel Celeron J3160 14 nm Stepping D1 Cores/Threads 4 / 4 |
|--|--|--|--|--|---|--|--|---|---|---|--|
| | | | | 2 | | _ | Stress FPU | Date & Time | Status | | Celeroni Inder QDF QK0N (QS) Eng. Sampl |
| 🔲 🕒 YouTube | | 4K sam | ple | | | _ | Stress system me | mory | | | CPU #0 Platform FCBGA1170 TDP Cache 4x32 + 4x24 + 2x1M |
| | 1 | 100 | | | | | Stress GPU(s) | - | | | MMX 3DNowl 3DNowl-2 SSE SSE-2 SSE-3 SSSE-3 SSSE-3 |
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| | | | | | | | 100% | | | | Chipset |
| | 1 | | 1000 | | | N. | | | | | BIOS Date 04/11/2019 BIOS Version BLT-BI-MINIPC-M6J UEFI |
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The noise in the free air is about 40 dba.
 Noise meter test vents, show : "40.7" dba
 The quiet voice does not feel the presence of a fan.



CPU Performance

MINIS FORUM

 3DMARK11 overall performance test results; Intel Celeron J3160 (P518) Better than Intel Celeron N3450(P490)





Intel Celeron N3450

GN31 @Intel Celeron J3160

CPU Performance

MINIS FORUM

 Ludashi v5.19 overall performance test result; J3160 (53944) than N3450(34987) 1.5 times.



GN31 @Intel Celeron J3160

Intel Celeron N3450

CPU Performance

MINIS FORUM

CINEBENCH R15

CPU:117cb Open GL:12.90 fps

CINEBENCH R15.0

| File Help | | | | | | |
|--|---|---------|--|--|--|--|
| ⊙ c | INEBENCH R | | | | | |
| OpenGL | 12.90 fps | Run | | | | |
| CPU | 117 cb | Run | | | | |
| Vour System - | | | | | | |
| Processor | Intel Celeron CPU J3160 | | | | | |
| Cores x GHz | 4 Cores, 4 Threads @ 1.60 GHz | | | | | |
| os | Windows 8, 64 Bit, Professional I | Editior | | | | |
| CB Version | 64 Bit | | | | | |
| GFX Board | Intel(R) HD Graphics 400 | | | | | |
| Info | | | | | | |
| Ranking — | | | | | | |
| OpenGL | Deta | ails 💽 | | | | |
| 1. 4C/8T @ 2 | .79 GHz, Quadro K4000M/PCIe/S | 67.71 | | | | |
| 2. 4C/8T @ 4 | .40 GHz, Quadro 4000/PCIe/SSE2 | 65.33 | | | | |
| 3. 6C/12T @ | 3.30 GHz, GeForce GTX 460/PCIe, | 59.86 | | | | |
| Station and the second | 4. 12C/24T @ 2.66 GHz, ATI Radeon HD 5770 57.08 | | | | | |
| No. of Concession, Name | .60 GHz, NVIDIA GeForce GT 650 | | | | | |
| and an and a state of the state | 40 GHz, GeForce GT 620/PCIe/S | 19.04 | | | | |
| | .60 GHz, Intel(R) HD Graphics 40 | 12.90 | | | | |
| 8. 2C/4T @ 1 | .70 GHz, Intel(R) HD Graphics 400 | 9.00 | | | | |

OpenGL performance J3160 than N3450 1.8 times



BESSTAR (HK) LIMITED GN31



| Upload Date | April 18 2019 11:16 AM |
|-----------------------|---|
| Views | 2 |
| System Information | |
| System Information | |
| Operating System | Microsoft Windows 10 Pro (64-bit) |
| Model | BESSTAR (HK) LIMITED GN31 |
| Motherboard | BESSTAR Tech Limited M6JR120 |
| Memory | 3942 MB DDR3 SDRAM 1067MHz |
| Northbridge | Intel Braswell Host Bridge 35 |
| Southbridge | Intel Braswell LPC Bridge 35 |
| BIOS | American Megatrends Inc. BLT-BI-MINIPC-M6JR120-BB80B-10 |
| Processor Information | |
| Name | ntel Celeron J3160 |
| Topology | 1 Processor, 4 Cores |
| Identifier | GenuineIntel Family 6 Model 76 Stepping 4 |
| Base Frequency | 1.60 GHz |
| Maximum Frequency | 2.24 GHz |
| Package | Socket 1170 BGA |
| Codename | Braswell |
| L1 Instruction Cache | 32.0 KB x 4 |
| L1 Data Cache | 24.0 KB x 4 |
| L2 Cache | 1.00 MB x 1 |
| OpenCL Information | |
| Platform Vendor | Intel(R) Corporation |
| Platform Name | Intel(R) OpenCL |
| Device Vendor | Intel(R) Corporation |
| Device Name | Intel(R) HD Graphics 400 |
| Compute Units | 12 |
| Maximum Frequency | 700 MHz |
| Device Memory | 1.53 GB |

OpenCL Performance

| Geekbench Browser | Geekbench 4 - | Geekbench 3 - | Benchmark Charts - | Q Search Res |
|------------------------------|---------------------|-------------------|--------------------------|--------------|
| | | | | |
| | | | | |
| | | | | |
| | | OpenCL S | core | |
| | | 480 | 6 | |
| Geekbench 4.3.3 Tryout for W | indows x86 (64-bit) | | | |
| Result Information | | | | |
| User | | | | |
| Upload Date | | April 22 2019 05 | 5:24 AM | |
| Views | | 3 | | |
| System Information | l | | | |
| System Information | | | | |
| Operating System | | Microsoft Windo | ws 10 Pro (64-bit) | |
| Model | | | | |
| Motherboard | | | | |
| Memory | | 3946 MB 797M | Hz | |
| Northbridge | | Intel Apollo Lake | e Host Bridge 0B | |
| Southbridge | | Intel Apollo Lake | ELPC Bridge 0B | |
| BIOS | | American Mega | trends Inc. 0.18 | |
| Processor Information | | | | |
| Name | | Intel Celeron N3 | 3450 | |
| Topology | | 1 Processor, 4 0 | | |
| Identifier | | | mily 6 Model 92 Stepping | 9 |
| Base Frequency | | 1.10 GHz | | |
| Maximum Frequency | | 2.09 GHz | | |
| Package | | Socket 1296 FC | BGA | |
| Codename | | Apollo Lake | | |
| L1 Instruction Cache | | 32.0 KB x 4 | | |
| L1 Data Cache | | 24.0 KB x 4 | | |
| L2 Cache | | 1.00 MB x 1 | | |
| OpenCL Information | | | | |
| Platform Vendor | | Intel(R) Corpora | ition | |
| Platform Name | | Intel(R) OpenCL | | |

12

700 MHz

1.54 GB

Compute Units

Device Memory

Maximum Frequency

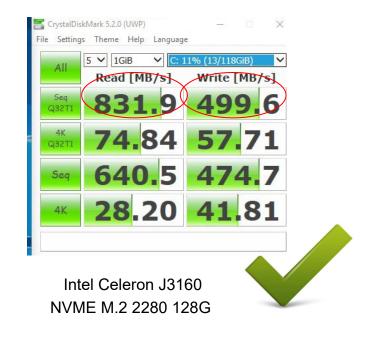
Memory Test

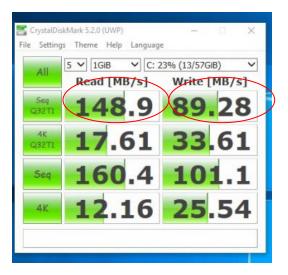
PassMark MemTest86 v7.5 test memory Address (Write/Read) →All passed, NO error.

| PassMark HemTest86 V7.5 Free Clk/Temp : 1600 MHz / 44C L1 Cache : 56K 20.62 GB/s L2 Cache : 1024K 16.41 GB/s L3 Cache : N/A Memory : 3496M 3104 MB/s RAM Info : PC3-8500 DDR3 106 | Pass 100% ################################### |
|---|--|
| CPU: 0123 State: \WWW | CPUs Found: 4 CPUs Started: 4 CPUs Active: 1 |
| Time: 4:39: Test complete | e, press any key to display summary rrors: 0 |
| Finished pass #1 (of 4) (Cun Finished pass #2 (of 4) (Cun Finished pass #3 (of 4) (Cun Finished pass #4 (of 4) (Cun ≻⊺est Complete | nulative error count: 0) nulative error count: 0) |

M.2 2280(NVME) 128G Test

- CrytalDiskMark5.2.0 test Result: NVMe M.2 2280 128G than EMMC5.1 64G 5.6 times
- The computer starts up only 14 seconds, no need to wait patiently





Intel Celeron J3160 EMMC5.1 64G

Burn in Test(PASSED)

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Setting parameters: Test time:720minute (12H) Test Item: 2D/3D Graphics ;CPU;Memory(RAM);Network ;Sound Test loading:100%

| 👸 BurnInTest V6.0 Pro - [Live Re | esults] | | | - 0 | × | 🕱 CPU-Z — 🗆 🗙 |
|----------------------------------|-------------|-----------------------------------|---|---|-----|---|
| File Edit Configuration Test | Quick Te | sts Help | | | | CPU Caches Mainboard Memory SPD Graphics Bench About |
| System Information Burn In Re | - | onfiguration 🗸 | | 0 | | Processor Name Intel Celeron J3160 Code Name Braswell Brand ID |
| Results for DESKTOP-JEUV | 878 | | | | | Package Socket 1170 BGA inside* Technology 14 nm Core VID 0.450 V CELERON* |
| Test configuration file: LastUs | | | | Status: PASS | - | Specification Intel® Celeron® CPU J3160 @ 1.60GHz (ES) |
| Start time: Wed Apr 03 | 00:35:23 2 | | | or 03 12:35:30 2019 Duration: 012h 00m 07s | 2 | Specification Andel C Cocppting 4 Ext. Family 6 Ext. Model 4C Revision D1 Instructions MMX, SSE, SSE2, SSSE3, SSSE4, I, SSE4.2, EM64T, VT-x, AES AES AES AES |
| Test Name | Cycle | Operations | | Last Error Description | | Clocks (Core #0) |
| 🕎 2D Graphics | 1285 | 1.285 Million | 0 | No errors | | Core Speed 479.80 MHz L1 Data 4 x 24 KBytes 6-way |
| 3D Graphics | 2956 | 5.912 Million | 0 | No errors | | Multiplier x 6.0 L1 Inst. 4 x 32 KBytes 8-way |
| CPU (RAM) | 9369 271 | 27.489 Trillion 1.695 Trillion | 0 | No errors No errors | | Bus Speed 79.97 MHz Level 2 2 x 1 MBytes 16-way |
| Network 1 | 2384 | 1.095 Million | 0 | No errors | | Rated FSB Level 3 |
| Sound | 2304 | 792 Million | 0 | No errors | | |
| Ready | A | SS | 5 | Image: Second system Image: Second system Image: Second | 720 | 100 20 Graphics // 100 50 30 Graphics // 100 50 Disk(s) 50 100 Sound // 100 50 Network // 100 50 Parallel Port 50 50 USB /// tivate |
| | | | | Plug-in | | Go to Settings to activ |

Windows Reboot cycle test

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Windows reboot 500 cycles test passed

| 🗭 PassMark Rebooter - Automatic Reboot Mode | - | | \times |
|--|---|---------|----------|
| Reboot options | | | 1 |
| | aving config file: Count 496 | | 1 |
| D 1 via Dahash | BOUT TO REBOOT, COUNT 496 OADED AFTER REBOOT, COUNT 496 | | |
| | OADED AFTER REBOOT, COUNT 496 TARTING COUNTDOWN TIMER FOR REBOOT, CO | UNT 496 | |
| Force shutdown Hist & didde 2019-Mar-12 09:05:25 S | aving config file: Count 497 | | |
| 2019-Mar-12 09:05:25 A | BOUT TO REBOOT, COUNT 497 | | |
| 2019-Mar-12 09:06:35 S | OADED AFTER REBOOT, COUNT 497 TARTING COUNTDOWN TIMER FOR REBOOT, CO | UNT 497 | |
| Launch application each cycle 2019-Mar-12 09:06:55 S | aving config file: Count 498 | | |
| | BOUT TO REBOOT, COUNT 498 | | |
| aunole application after all queles finished | OADED AFTER REBOOT, COUNT 498 TARTING COUNTDOWN TIMER FOR REBOOT, CO | UNT 498 | |
| 2019-Mar-12 09:08:31 S | aving config file: Count 499 | | |
| | BOUT TO REBOOT, COUNT 499 | | |
| Log lie e: le colo le codinente : | OADED AFTER REBOOT, COUNT 499 TARTING COUNTDOWN TIMER FOR REBOOT, CO | UNT 499 | |
| | aving config file: Count 500 | | |
| 2019-Mar-12 09:10:04 A | BOUT TO REBOOT, COUNT 500 | | |
| | oaded previous log file OADED AFTER REBOOT, COUNT 500 | | |
| Auto-login 2019-Mar-12 09:11:15 L 2019-Mar-12 09:11:15 L | | | |
| Auto-login is currently DISABLED 2019-Mar-12 09:11:15 S | aving config file: Count 1 | | |
| 2019-Mar-12 09:11:15 F | INISHED REBOOT CYCLE | | |
| Domain | | | |
| User Name J3160 | | | - |
| • | | | • |
| Password | | | |
| Set Auto-login Disable Auto-login | | | |
| Set Auto-login Disable Auto-login Start Cycle Pause | Stop Cycle Close About | Help | |
| | | | |
| | | | |
| Rebooter - Final Reboot Completed X | | | |
| | | | |
| PassMark Rebooter | | | |
| Steam Stea | | | |
| the reboot counter has been reset | | | |
| | | | |
| ОК | | | |
| | | | |

HDMI / VGA output display

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• Smooth 4K test video playback, support 4K@30Hz

| rocesses Performance App hist | ory Startup Users Details Se | rvices | | |
|--------------------------------------|----------------------------------|--|----------------------------------|-----|
| CPU 15% 0.84 GHz | CPU In % Utilization | tel(R) Celeron(R) CPU J31 | 160@ 1.60GHz | |
| Memory 2.0/3.8 GB (53%) | | | | |
| Disk 0 (C:) | 60 seconds | | | |
| Disk 1 (E: D:) 0% | Utilization Speed 15% 0.84 GH | Base speed: Hz Sockets: Cores: | 1.60 GHz 1 4 | |
| GPU 0 Intel(R) HD Graphics 31% | | Handles Logical processors: 46659 Virtualization: L1 cache: L2 cache: | 4 Enabled 224 KB 2.0 MB | |
| Fewer <u>d</u> etails 🔊 Open Reso | urce Monitor | | 3 | |
| 4 | | | | |
| 2.0 | | | - | m d |
| (R) HD Graphics 400 | | | | |
| | | | | |
| rt Date: | Thursday, January 24, 2019 | Processor: | Intel(R) Celeron(R) CPU J3160 @ | |
| | | | | |
| ort Time [hh:mm:ss]: er Version: | 10:11:22 PM 20.19.15.4835 | Processor Speed: | 1.60GHz 1600 MHz | |

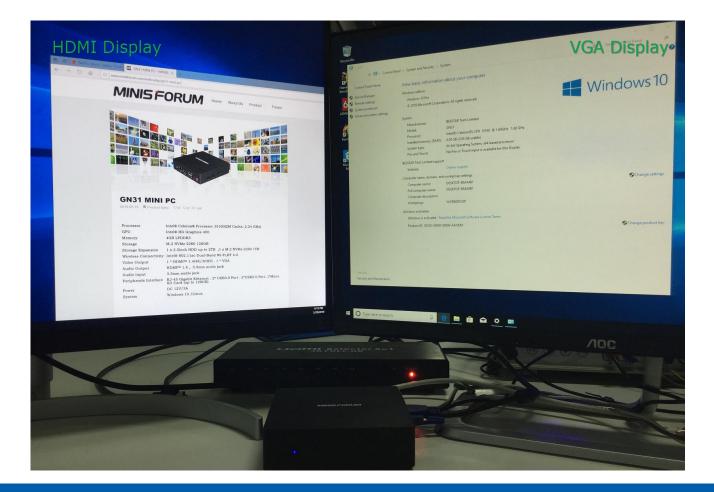
| General Security Details Previous Versions Property Value | ^ |
|--|--|
| Property Value | |
| Rating Ar Ar Ar Ar Taga Comments | |
| Video Length 00:03:40 Frame width 3840 Frame height 2160 Data rate 27020kbps | |
| Total bitrate 27212kbps Frame rate 30.00 frames/second Audio | _ |
| Bit rate 191kbps Channels 2 (stereo) Audio sample rate 44.100 kHz | |
| | |
| Year | ~ |
| OK Cancel | <u>A</u> pply |
| | |
| | |
| | |
| | |
| | 100 |
| | Taga Comments Viceo Length 00:03:40 Frame height 2160 Data rate 27020kbps Total bitrate 27212kbps Total bitrate 27212kbps Total bitrate 27212kbps Total bitrate 30:00 frames/second Audio Bit rate 191kbps Channels 2 (sterec) Audo sample rate 44.100 kHz Media Contributing artists Year Remove Properties and Personal Information |

| Current Resolution: | 3840 x 2160 | | | |
|-------------------------|--------------------------------|-----------------------------|--------------------------|--|
| Video BIOS: | 1008.0 | Hardware-Supported Version: | 11.1 | |
| Device Revision: | 35 | Runtime Version: | 12.0 | |
| Device ID: | 22B1 | Microsoft DirectX* | 0 | |
| Vendor ID: | 8086 | OpenCL* Version: | 1.2 | |
| Physical Memory: | 3493 MB | OpenGL* Version: | 4.4 | |
| Default Language: | English (United States) | Shader Version: | 5.0 | |
| Operating System: | Windows* 10 Home (10.0.17134) | Processor Graphics in Use: | Intel(R) HD Graphics 400 | |
| Driver Version: | 20.19.15.4835 Processor Speed: | | 1600 MHz | |
| Report Time [hh:mm:ss]: | 10:11:22 PM | | 1.60GHz | |
| Report Date: | Thursday, January 24, 2019 | Processor: | Intel(R) Celeron(R) CPU | |
| | | | | |

rino selp e

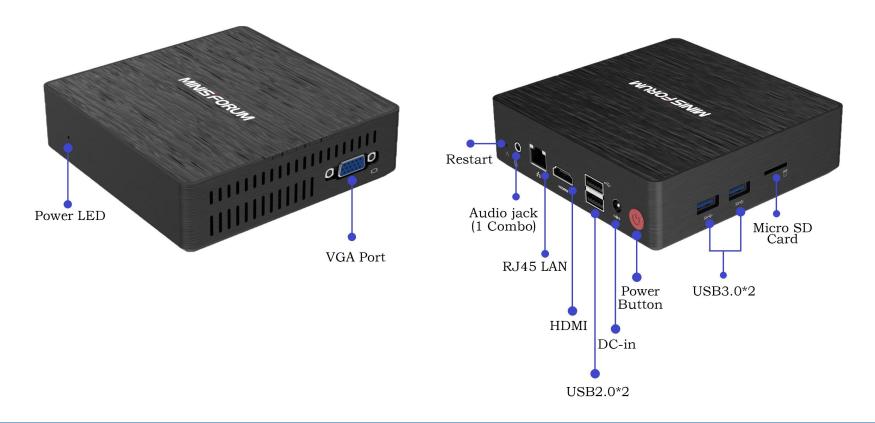
HDMI / VGA output display

- Support multi-tasking operation, you can work while watching the home theater.
- The price of one GN31 is equivalent to the function of two MINI PCs.



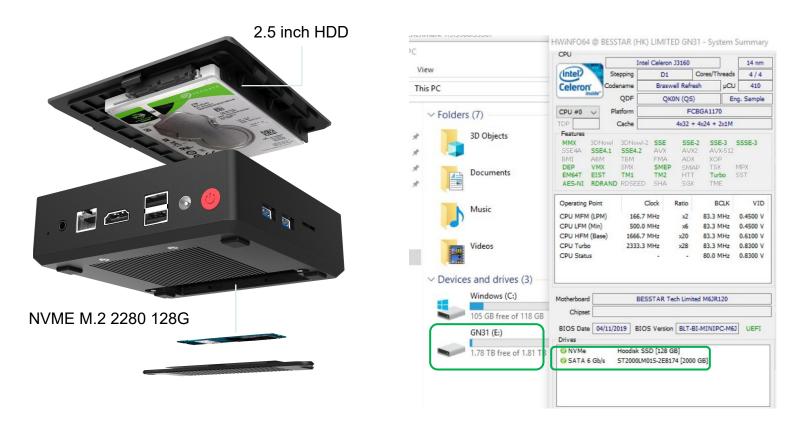
Input/Output Strong Scalability

- With 2*USB 3.0 Ports (Left and Right)
- With 2*USB 2.0 Ports (Up and Down)
- With 1*TF Slot (Micro-SD Slot)



Easy DIY Upgradability

- Easy DIY Upgradability
- DIY 2.5 inch HDD (Supports up to 2TB, SATA3.0 6Gb/S)
- DIY NVME M.2 2280 (Support up to 512GB, PCIe3.0 x2 16Gb/S) (Note: 2TB and 512GB are our test capacity and can actually support larger than this.)



END



Thank you!