Technical Product Specification

Bloodhound / Generation #1

Model # NDN23BHFiC

Version: 1.5

Date: 11/17/2023

Preface

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1. Description

Overview

A small form factor PC based on the ***Intel CELERON N5105 ULX*** processor. The system has the following features;

- Chassis measures 133 mm x 98 mm x 35 mm / 5.24” x 3.86” x 1.38”
- (2) Type-A USB 3.0 ports (Front)
- (1) Type-C USB 3.0 (Front)
- (1) 10 Pin Front Panel Header (Front)
- (1) 3.5mm Audio out jack (Front)
- (1) Micro SD Card reader port (Front)
- (3) 2.5GbE ports, 1 Trusted & 2 Regular (Rear)
- (1) HDMI 2.0 Port (Rear)
- (1) mDP 1.4 Port (Rear)
- (1) Type-A USB 2.0 Port (Rear)
- The enclosure is all metal, (Aluminum) chassis and is passively cooled
- The chassis is intended to meet IPC-53 performance level, (i.e. dust resistant)
- PCB “Conformal Coating” (Optional) (MOQ)

1.1. Processor

Table 1: CPU Features

Intel / Celeron N-Series	N5105 Jasper Lake ULX
Cores	4
Threads	4
L1 Cache	4M Intel Smart Cache
Base Frequency	2.90GHz
TDP [W]	10 Watts
Integrated Graphics	Yes

***Note:** See further integrated graphics details below…*

1.2. Integrated Graphics Processing Unit

Table 2: Embedded Graphics Features

Intel / Embedded	Intel® UHD Graphics
Graphic Base Frequency	450MHz
Execution Units	24
L4K Support	@60Hz
Max Resolution (HDMI)	4096x2160@60Hz
Max Resolution (DP)	4096x2160@60Hz
Intel Quick Video Support	Yes
Device ID	0x4E61

1.3. Memory

- 4GB / 8GB / 16GB / 32GB Configurations (Soldered Down)
- DDR4-2933MHz

1.4. Storage

(1x) M.2 2280 Slot SATA Only

- "M" Key
- Up to 2TB SATA

1.5. Networking / RJ-45 Connectors

(3x) NICs / Realtek 8125 - IEEE-1588v2

- (1x) 2.5GbE with PoE + (Left Most RJ-45 when viewed from the rear)
- (2x) 2.5GbE

1.5.1. PoE + (PoE Plus)

- IEEE 803.BT (Type 3 Up To 60 Watts)
- 30 Watts (Minimum)

1.5.2. Networking Wireless Interface

- (1) M.2 2232 Slot (Not Populated)
- “B” Key

2. Technical References

2.1. Headers – Top of Board

Fig. # 1: Top SidePCB Headers / Connector Locations

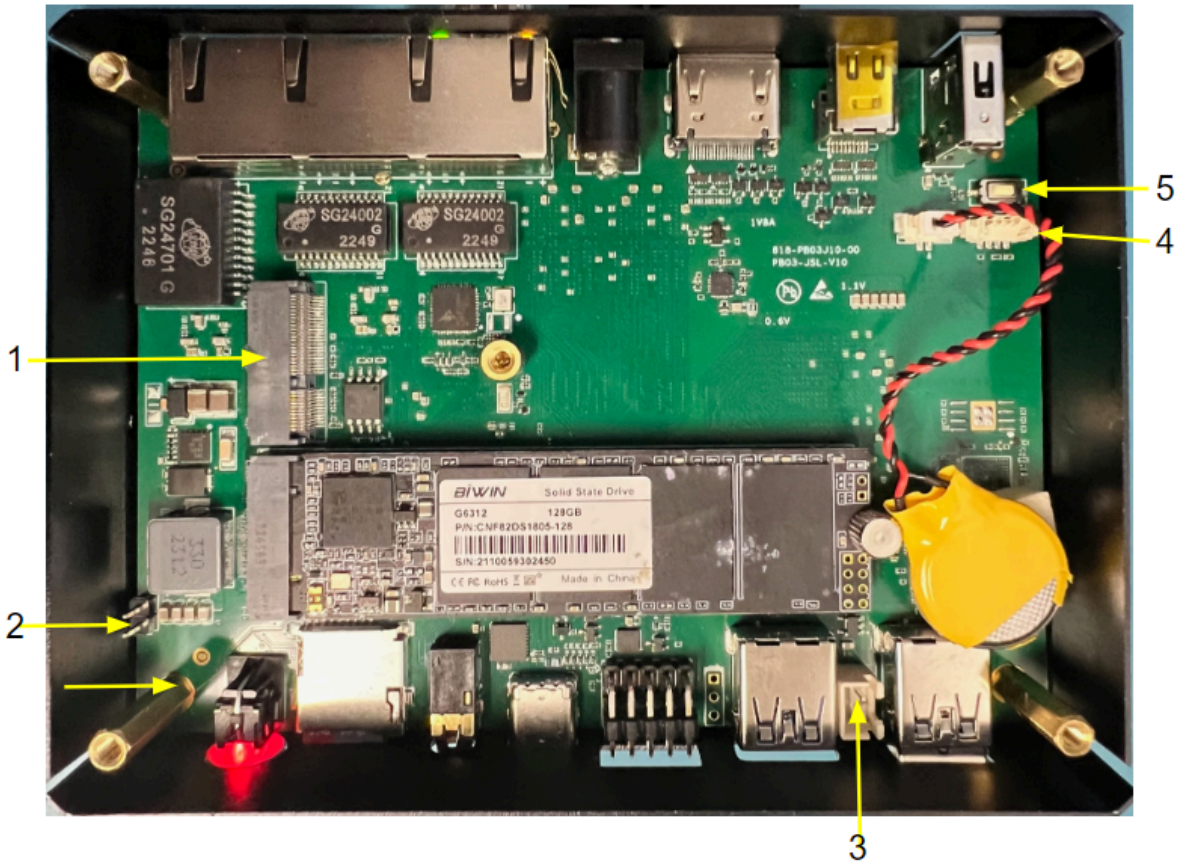


Table 3: Top Side Header Definitions

Identifier	Header
1	Wi-Fi Module / 2nd Expansion Slot
2	Power On Jumper
3	12VDc 2 Pin Header
4	Reserved Fan Header
5	CMOS Clear Button

2.2. Battery & Header

Fig. # 2: CMOS Battery

Table 4: CMOS Battery / Header Pinout

Pin	Signal
1	3.3VDc Power / + (Red)
2	GND / - (Black)

***Note:** If battery is replaced is must be replaced with a battery classified for "high temp" ./ 60 degrees C application*

2.3. M.2 2280 Storage / SATA

Table 5: M.2 Key-M / B Key SSD Pinout

Pin	Signal	Signal	Pin
74	3.3V	GND	75
72	3.3V	GND	73
70	3.3V	GND	71
68	SUSCLK(32kHz) (O)(0/3.3V)	PEDET (NC-PCIe / GND / SATA)	69
66	CONNECTOR KEY	N/C	67
64	CONNECTOR KEY	CONNECTOR KEY	65
62	CONNECTOR KEY	CONNECTOR KEY	63
60	CONNECTOR KEY	CONNECTOR KEY	61
58	N/C	CONNECTOR KEY	59
56	N/C	GND	57
54	PEWAKE# (I/O)(0/3.3V) or N/C	REFCLKp	55
52	CLKREQ# (I/O)(0/3.3V) or N/C	REFCLKn	53
50	PERST# (O)(0/3.3V) or N/C	GND	51
48	N/C	PETp0/SATA-A+	49
46	N/C	PETn0/SATA-A-	47
44	N/C	GND	45
42	SMB_DATA	PERp0/SATA-B-	43
40	SMB_CLK	PERn0/SATA-B+	41
38	DEVSLP (O)	GND	39
36	N/C	PETp1	37

Pin	Signal	Signal	Pin
34	N/C	PETn1	35
32	N/C	GND	33
30	N/C	PERp1	31
28	N/C	PERn1	29
26	N/C	GND	27
24	N/C	PETp2	25
22	N/C	PETn2	23
20	N/C	GND	21
18	3.3V	PERp2	19
16	3.3V	PERn2	17
14	3.3V	GND	15
12	3.3V	PETp3	13
10	DAS/DSS# (I/O)/LED1# (I)(0/3.3V)	PETn3	11
8	USB_D-	GND	9
6	USB_D+	PERp3	7
4	3.3V	PERn3	5
2	3.3V	GND	3
		GND	1

2.4. DDR4 (Soldered Down)

- JEDEC Standard up to 16 Gig / DDR4 Memory

2.5. Front Panel Header

The front panel header is a 2.00mm, 2×5 9-circuit, male header. It connects to the front panel switches and LEDs.

Figure 3: Front Panel Header

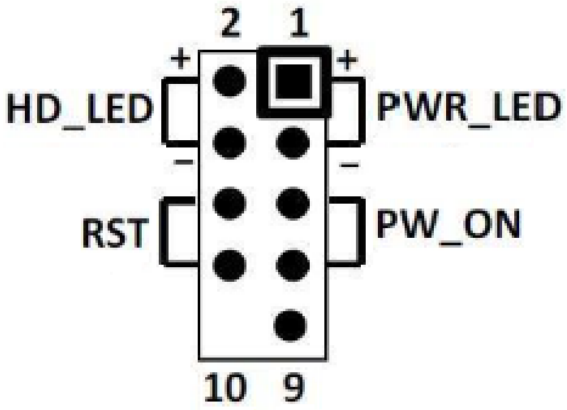


Table 6: Front Panel Header Pinout

Pin	Header	Signal
1	HD_LED	HD_PWR
3		HD_Active
2	PWR_LED	PWR LED+
4		PWR LED-
5	RESET	GND
7		RST BTN
6	PW_ON	PWR BTN
8		GND
9	No Connect	+5V
10	Empty	Empty

2.6. Chassis I/O Connectors - Front

Figure 4: Front Side I/O Connections

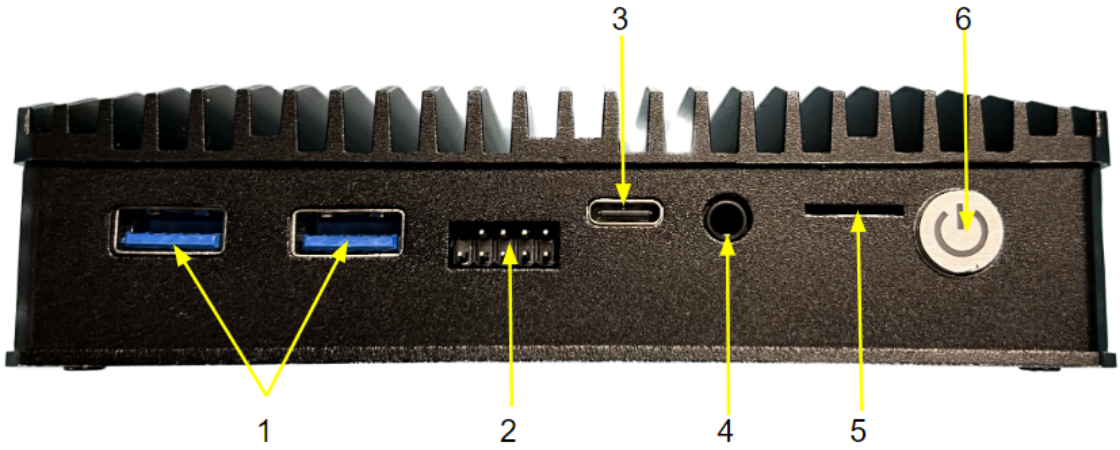


Table 7: Front Side I/O Connections

Identifier	Connector
1	Dual USB 3.0 Gen 2 Type-A
2	Front Panel Header
3	USB 3.0 Gen 2 Type-C
4	HD Audio Jack (Headset Only)
5	Micro SD Card Slot
6	Power Button

2.7. Chassis I/O Connectors - Rear

Fig. # 5: Rear Side I/O Connections

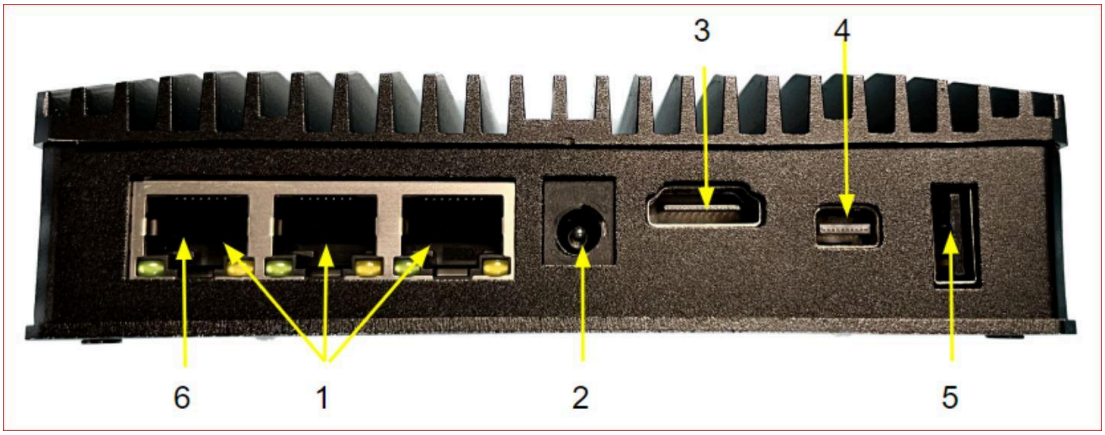


Table 8: Rear Side Connections Defined

Identifier	Connector
1	RJ-45 /r 2.5 Gigabit Ethernet
2	Lockable DC Power Input
3	HDMI 2.0 Port
4	Mini DisplayPort 1.4 (mDP)
5	USB 2.0 Type A
6	PoE+ (In) Enabled RJ-45

3. Mechanical Dimensions

Chassis Dimensions

- 133mm x 98mm x 35 mm
- 5.24” x 3.86” x 1.38”

Motherboard Dimensions

- 130mm x 100mm
- 5.12” x 3.94”

3.1. Motherboard Height

Fig. # 6: Motherboard Height Dimensions

Max Height / Rear 20mm…

Max Height / Front 10mm…

3.2. Environmental Limits

Temperature Limits	Temperature Range	Notes
Storage	-40 to 110 C (-40 to 230 F) Degrees	
Running	0 to 60 C (32 to 140 F) Degrees	External Fan allows up to 80 C (176 F) operation. Note: Up to an 80mm square fan is supported…

4. Power Supply

Bloodhound utilizes a small switching DC power brick rated as follows;

- 100 VAc - 240VAc
- 12VDc / Nominal Runtime
- 7.5 VDc / Operational Limit Minimal (Boot up & runtime under stress)
- 2.0 Amps
- 24.0 Watts

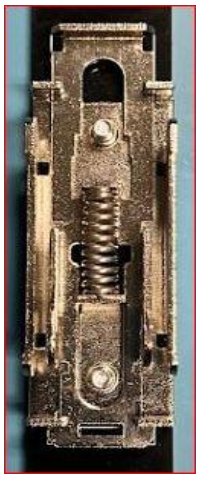
5. PoE+ Based Power

Bloodhound can also utilize a PoE+ Injector in place of the PSU noted above. It requires a minimum of 30 Watts at the destination. Note that loss can / will occur over a length exceeding 100 meter or 325 ft of CAT 5 or higher “Copper” cable.

5.1. Chassis Mounting Schemes

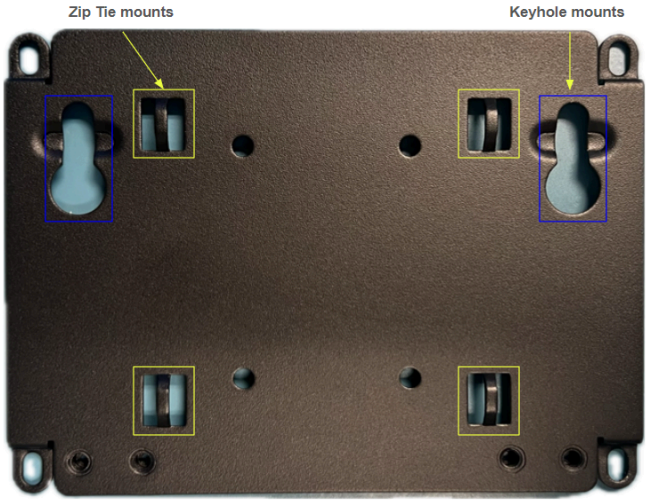
The Bloodhound chassis is mountable by way of a DIN Rail mount adapter, (ordered separately) that attaches to the side of the chassis. It can also be mounted by way of a VESA plate that comes with the system.

Fig. #7: Chassis Side Mount DIN Rail Adapter



P/N: [TBD]

Fig. # 8: VESA Plate Adapter



Note: The VESA plate also allows for tie wraps to be attached to other surfaces…

The VESA pilates mounts to the system by way of removing the rubber feet and then aligning the plate to the 4 holes on the outer corners then replacing the rubber feet. There are two ways of attaching the system with its VESA plate, a) using tie wraps or b) hanging the system on two screws by aligning the screws to the two keyway holes.

6. Version History

Version	Date	Comments
0.1	06/6/2023	Initial, draft release for internal review
1.0	6/19/2023	Release Version Formatting updates
1.1	08/21/23	Technical Revisions: ● Adding PoE + 302.at / Section # 1.5 ● Clarified M.2 2280 Support For SATA ● Added Enioremential Limits / Section # 3.2 ● Added P/N for slim / side mount DIN rail / Section # 4.1
1.2	08/22/23	Technical Revision; ● Clarified which RJ-45 connector is PoE + Enabled Note: Refer to section 1.5…
1.3	10/23/23	Technical Revision: ● Updated roar I/O image specifically calling out PoE+ enabled RJ-45 jack. Note: Refer to section 2.7…
1.4	10/24/23	Technical Revision: ● A change to the layout was made prompting the need to revise the rear I/O image. Refer to sections 1.5 and 2.7…
1.5	11/17/23	Technical Revision: ● Added lowest operation DCc limit, Section #4… ● Added additional Details on PoE+ based power, input wattage 30 Watts minimum at destination… ● Added additional details on the attachment and mounting approaches for the VESA plate…