Restore H4 BIOS Firmware

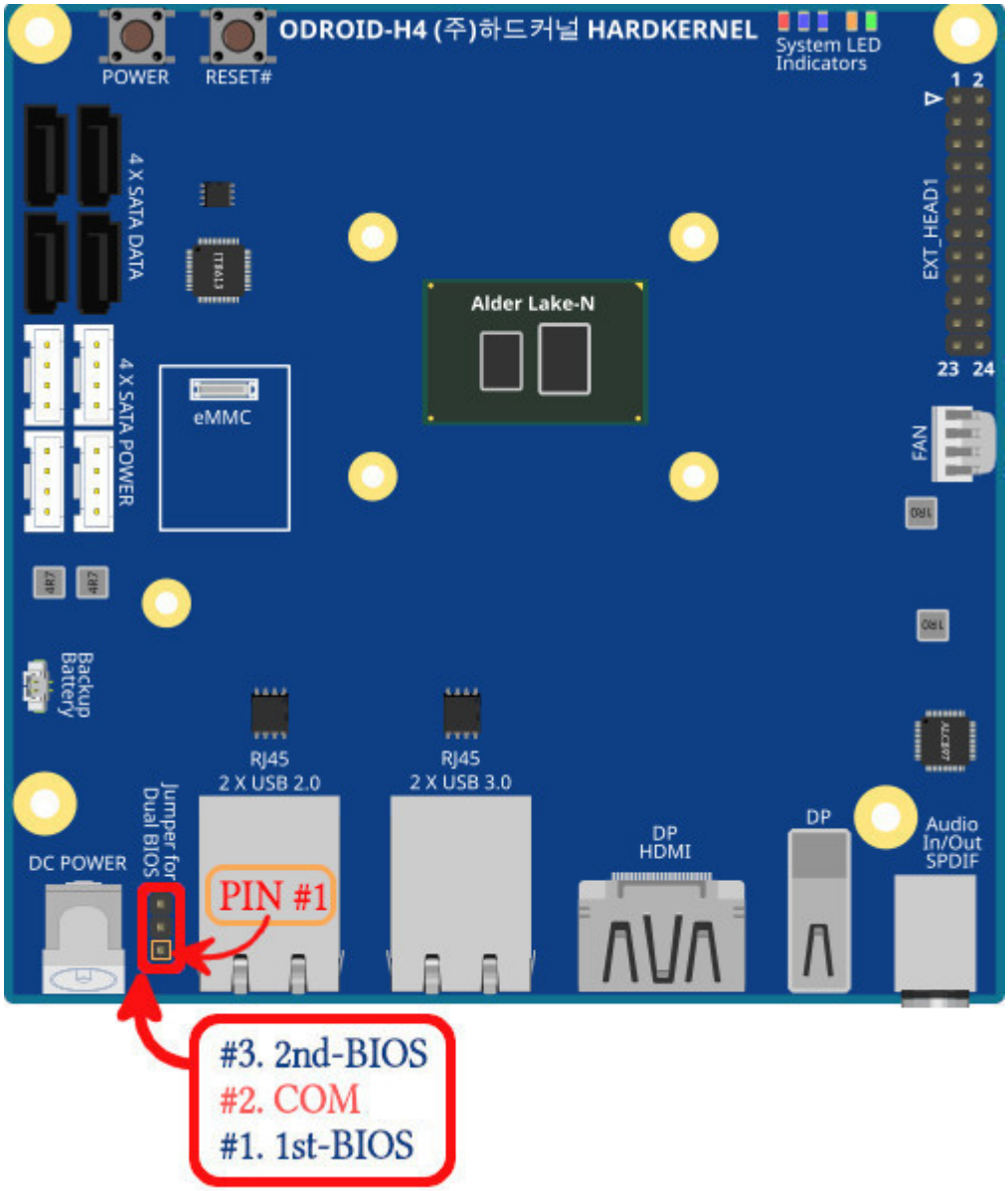
You should know the below lists to proceed to restore.

1. **ODROID-H4+/H4-Ultra** has adapted **a Dual BIOS** feature **(No Dual BIOS feature with ODROID-H4 - Howto restore)**. When the BIOS fails and is unable to boot, you can move the jumper to the other header pin manually to select a “Backup” BIOS. It will be booted without issue via the “Backup” BIOS and give you a chance to recover the failed BIOS.

2. From the center of the header pin(**COM**-picture below), “Backup” BIOS can be one that by the location of a jumper is either up(1st-BIOS) or down(2nd-BIOS) places. It is up to you which one of both can be “Backup” BIOS. **However, when a jumper pin is not placed in the header pin on any side, the 1st-BIOS will be loaded by design.**

3. The process of restoring BIOS is similar to updating BIOS. You need to get BIOS updating tools in a USB key drive.

4. It can be performed on Windows or an EFI Shell mode as shown below.



Requirements

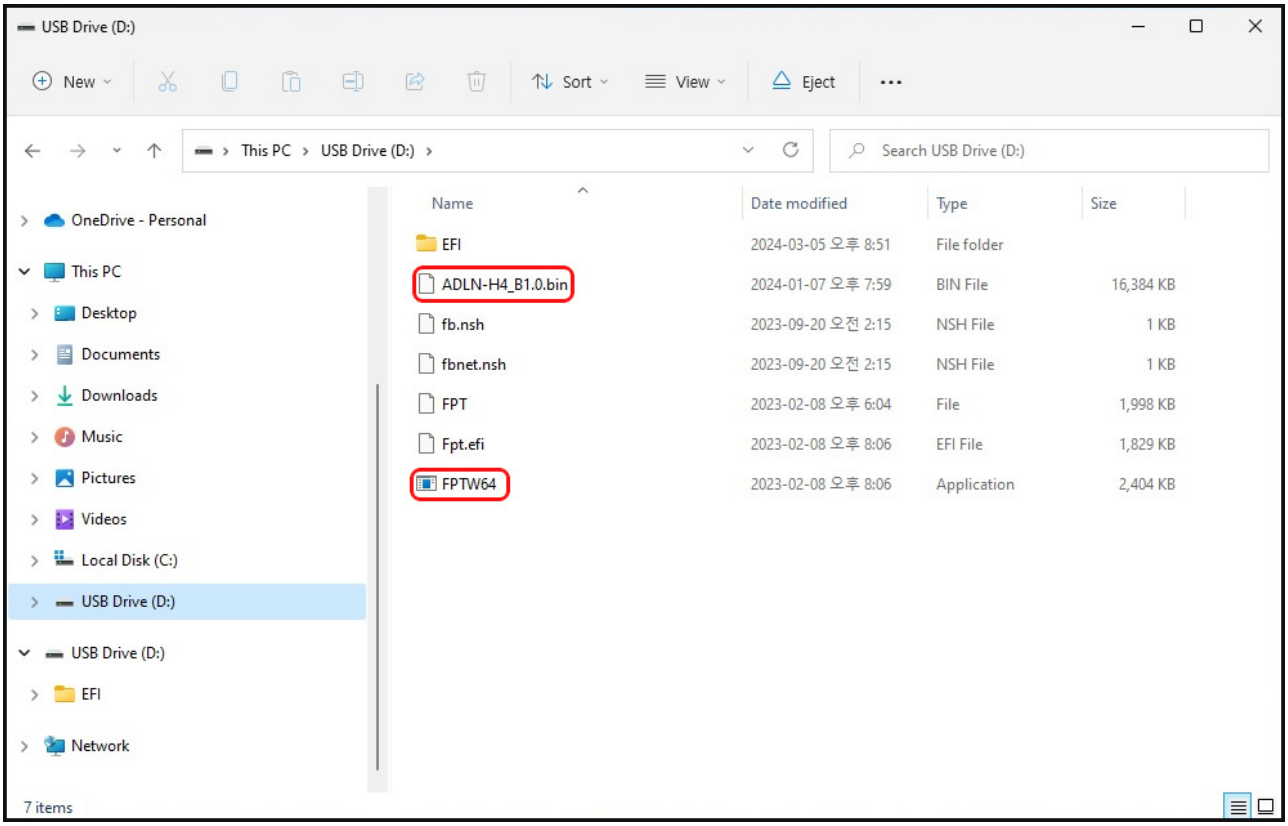
The same as BIOS updating tools.

- A USB key drive
- BIOS F/w and update tools

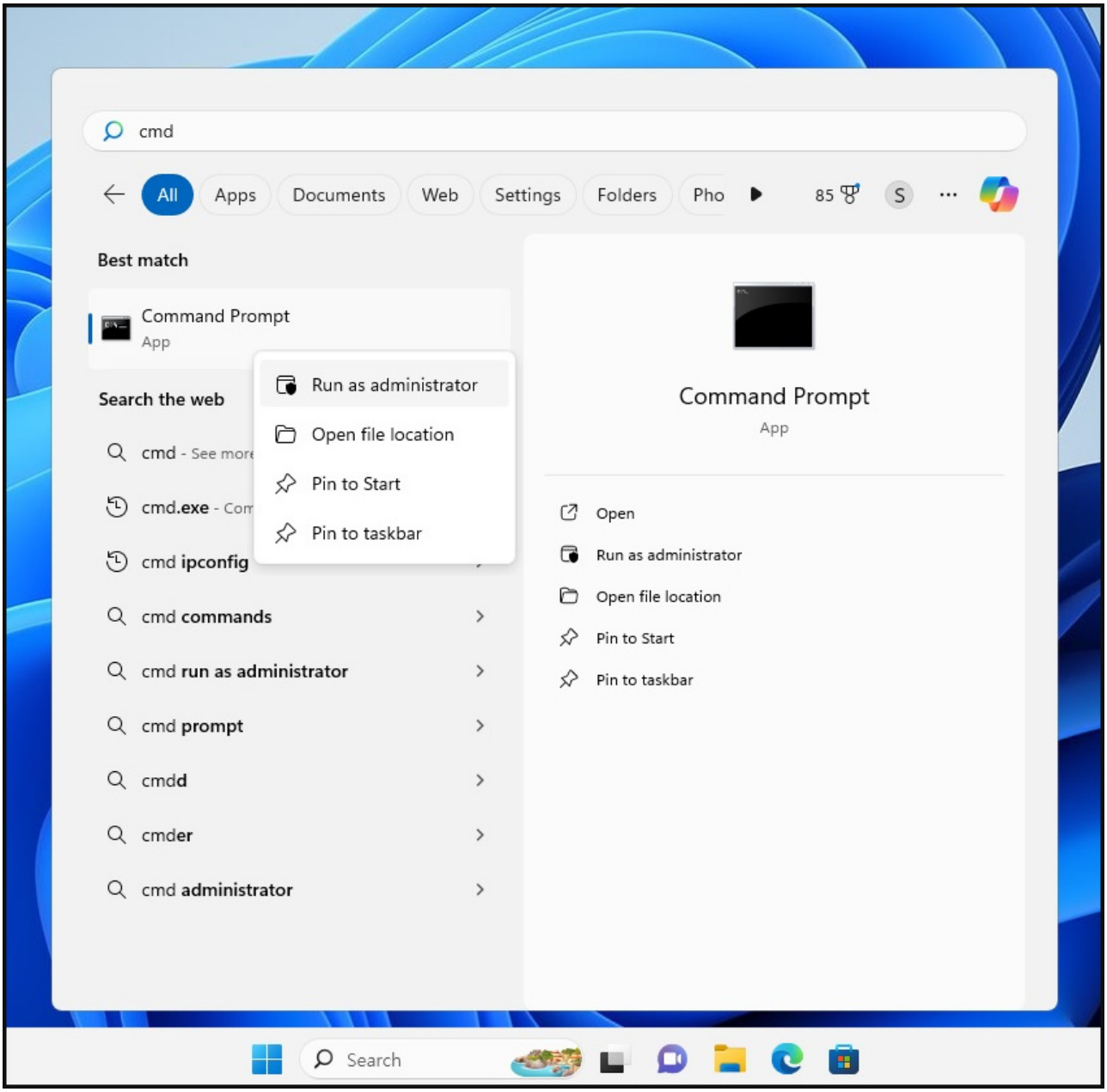
On Windows

- **Step 0**. **Power off, set a jumper to “Backup” BIOS on the Header pin, and, power on**

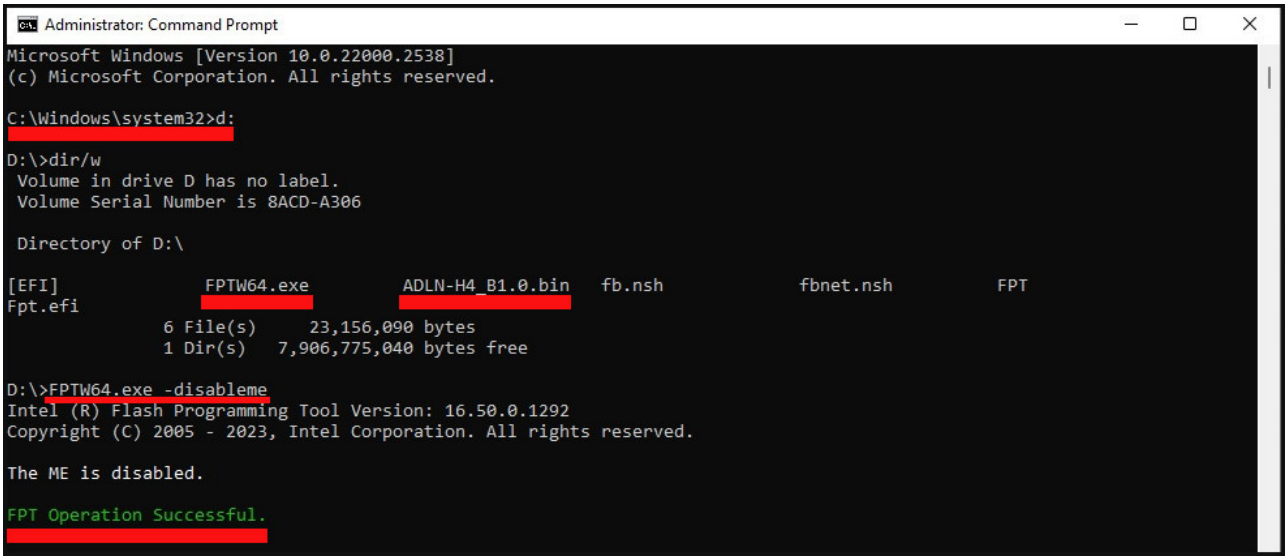
- **Step 1**. **Booting Windows OS**
  Windows OS booting, put a USB key drive to any USB port on ODROID-H4, and check the USB drive. Two files in red rounds will be used as below picture.



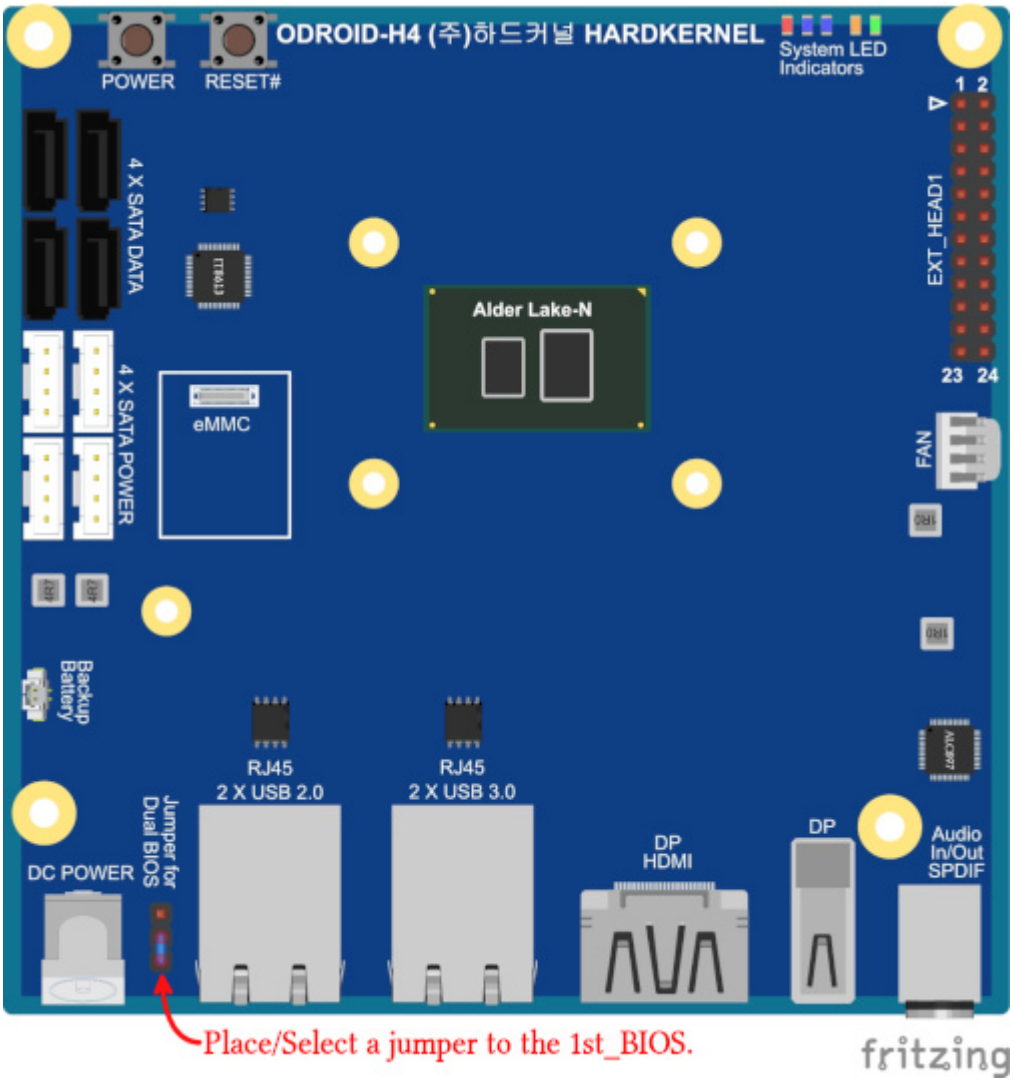
- **Step 2**. **Run Command Prompt as administrator**
  Hit the windows key + E key, type *cmd*, Windows shows *Best match* on top, move on mouse pointer on it, click the right button on a mouse, and, showed *Run as administrator*.
  Run it.



- **Step 3**. **Make disable ME**
  Go to location where FPT(Flash Programming Tool) file in there and run ***FPTW64.exe -disableme***



- **Step 4**. **Change to failed BIOS by moving a jumper**
  Move a jumper to select the failed BIOS.
  In the image below, the 1st_BIOS will be restored. **(No jumper pin on the header pin is the same as selecting the 1st_BIOS)**



- **Step 5**. **Writing a firmware to the failed BIOS**
  Type *FPTW64.exe -f ADLN-H4_B1.0.bin (in this case the firmware file is* ADLN-H4_B1.0.bin *)* then, hit the enter key will be started to restore the BIOS.
  It is the same step as writing firmware to the SPI-ROM when you are updating BIOS.

```
D:\>FPTW64.exe -f ADLN-H4_B1.0.bin
Intel (R) Flash Programming Tool Version: 16.50.0.1292
Copyright (C) 2005 - 2023, Intel Corporation. All rights reserved.

Reading HSFSTS register... Flash Descriptor: Valid

    --- Flash Devices Found ---
    ID:0xEF7018    Size: 16384KB (131072Kb)

GbE Region does not exist.

Processing Flash memory block     0 from  4095.
- Erasing Flash Block [0x001000] - 100 percent complete.
- Programming Flash [0x0001000]     4KB of     4KB - 100 percent complete.
Processing Flash memory block   408 from  4095.
- Erasing Flash Block [0x199000] - 100 percent complete.
- Programming Flash [0x0199000]     4KB of     4KB - 100 percent complete.
Processing Flash memory block   472 from  4095.
- Erasing Flash Block [0x1D9000] - 100 percent complete.
- Programming Flash [0x01D9000]    96KB of    96KB - 100 percent complete.
Processing Flash memory block   550 from  4095.
- Erasing Flash Block [0x227000] - 100 percent complete.
- Programming Flash [0x0227000]    16KB of    16KB - 100 percent complete.
Processing Flash memory block   556 from  4095.
- Erasing Flash Block [0x22D000] - 100 percent complete.
- Programming Flash [0x022D000]     8KB of     8KB - 100 percent complete.
Processing Flash memory block   558 from  4095.
- Erasing Flash Block [0x22F000] - 100 percent complete.
- Programming Flash [0x022F000]     4KB of     4KB - 100 percent complete.
Processing Flash memory block   565 from  4095.
- Erasing Flash Block [0x236000] - 100 percent complete.
- Programming Flash [0x0236000]    12KB of    12KB - 100 percent complete.
Processing Flash memory block   577 from  4095.
- Erasing Flash Block [0x242000] - 100 percent complete.
- Programming Flash [0x0242000]    28KB of    28KB - 100 percent complete.
Processing Flash memory block   586 from  4095.
- Erasing Flash Block [0x24B000] - 100 percent complete.
```

- **Step 6**. **Writing has done & Reconnect the power code**
  The writing is done with no issue as seen in the green words “FPT Operation Successful”, pull out the power code, wait roughly 5 min, power to the H4 back, and, it will be booted via the restored BIOS.

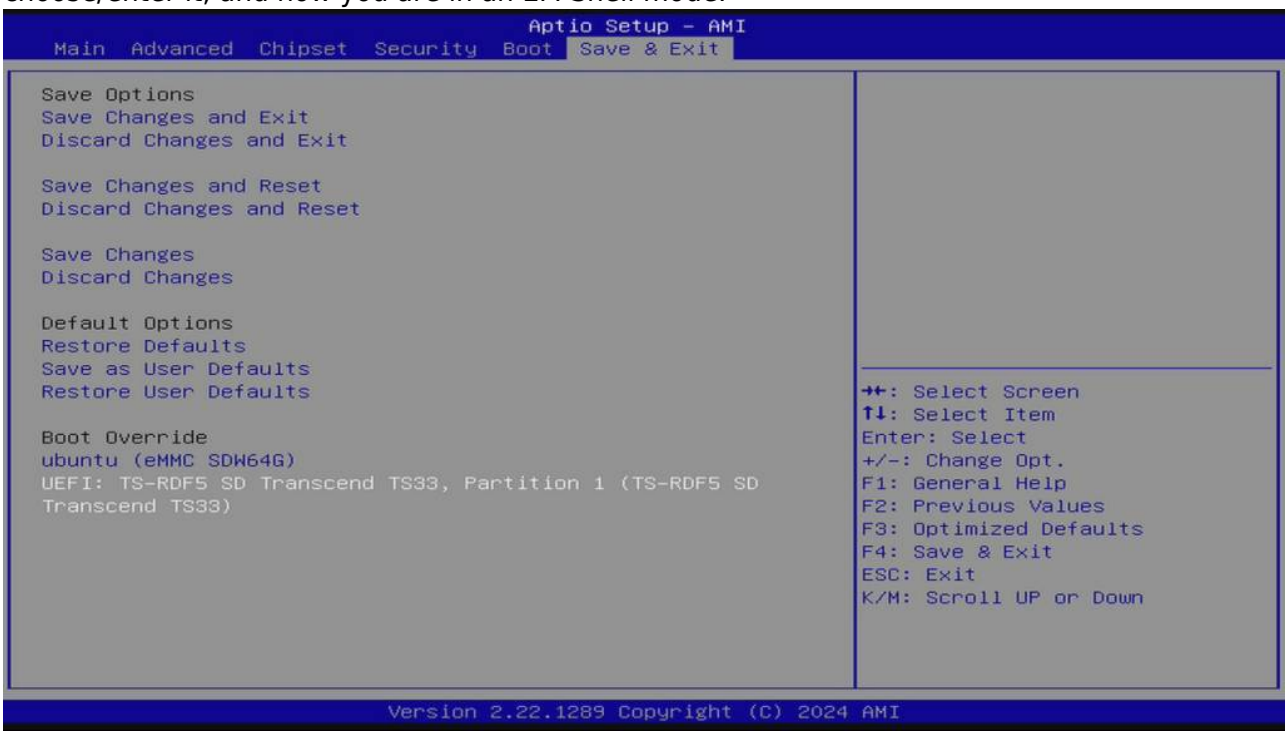
```
- Erasing Flash Block [0xBA7000] - 100 percent complete.
- Programming Flash [0x0BA7000]   276KB of   276KB - 100 percent complete.
Processing Flash memory block  3515 from  4095.
- Erasing Flash Block [0xDBC000] - 100 percent complete.
- Programming Flash [0x0DBC000]   296KB of   296KB - 100 percent complete.
Processing Flash memory block  3974 from  4095.
- Erasing Flash Block [0xF87000] - 100 percent complete.
- Programming Flash [0x0F87000]     8KB of     8KB - 100 percent complete.
Processing Flash memory block  3996 from  4095.
- Erasing Flash Block [0xF9D000] - 100 percent complete.
- Programming Flash [0x0F9D000]    76KB of    76KB - 100 percent complete.
Processing Flash memory block  4038 from  4095.
- Erasing Flash Block [0xFC7000] - 100 percent complete.
- Programming Flash [0x0FC7000]     8KB of     8KB - 100 percent complete.
Processing Flash memory block  4060 from  4095.
- Erasing Flash Block [0xFDD000] - 100 percent complete.
- Programming Flash [0x0FDD000]    76KB of    76KB - 100 percent complete.
- Processed memory blocks 4095 from 4095.
- Verifying Flash [0x1000000] 16388KB of 16384KB - 100 percent complete.
RESULT: The data is identical.

Flash device was programmed. It is recommended to perform
G3 power cycle to complete the flashing process.

FPT Operation Successful.


D:\>
```

On an EFI Shell

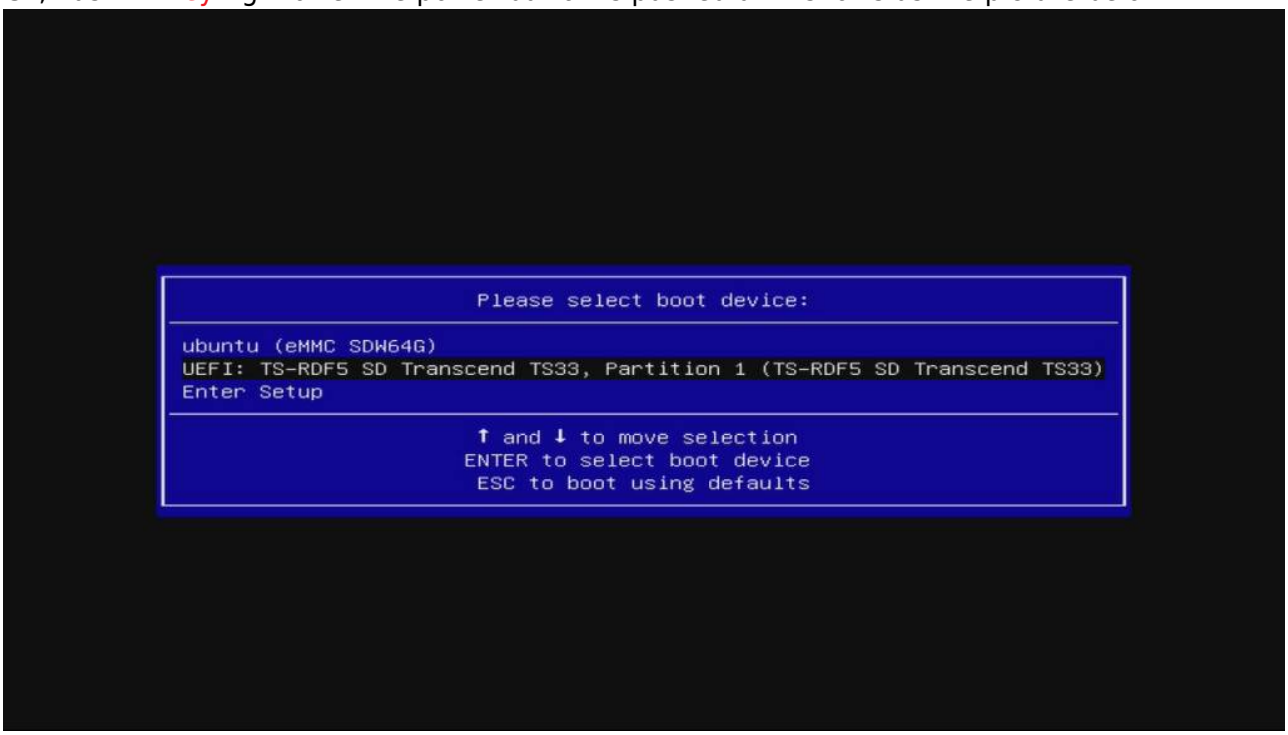
- **Step 0**. **Power off, put a USB key drive to any USB port on ODROID-H4, set a jumper to “Backup” BIOS on the Header pin, and, power on**

- **Step 1**. **Boot from a USB key drive**

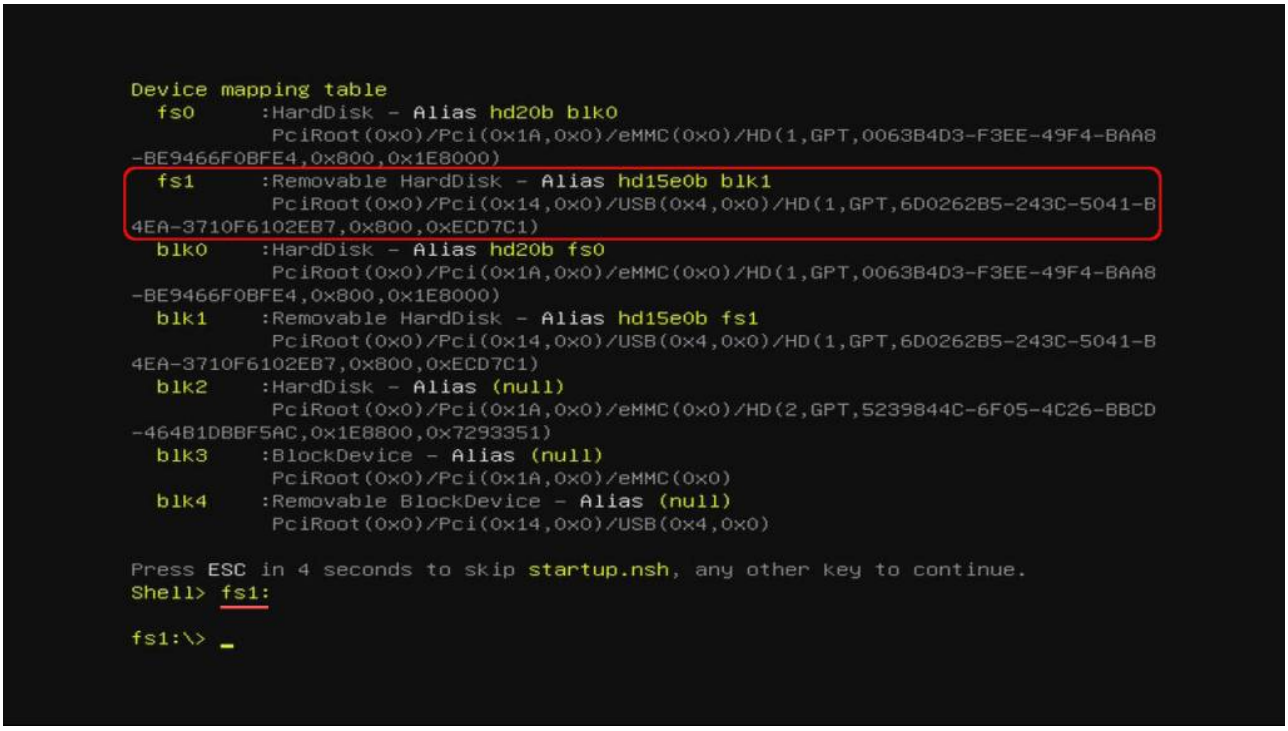
Enter the BIOS setup menu, move to the Save & Exit tab, you can see the USB key drive, choose/enter it, and now you are in an EFI Shell mode.



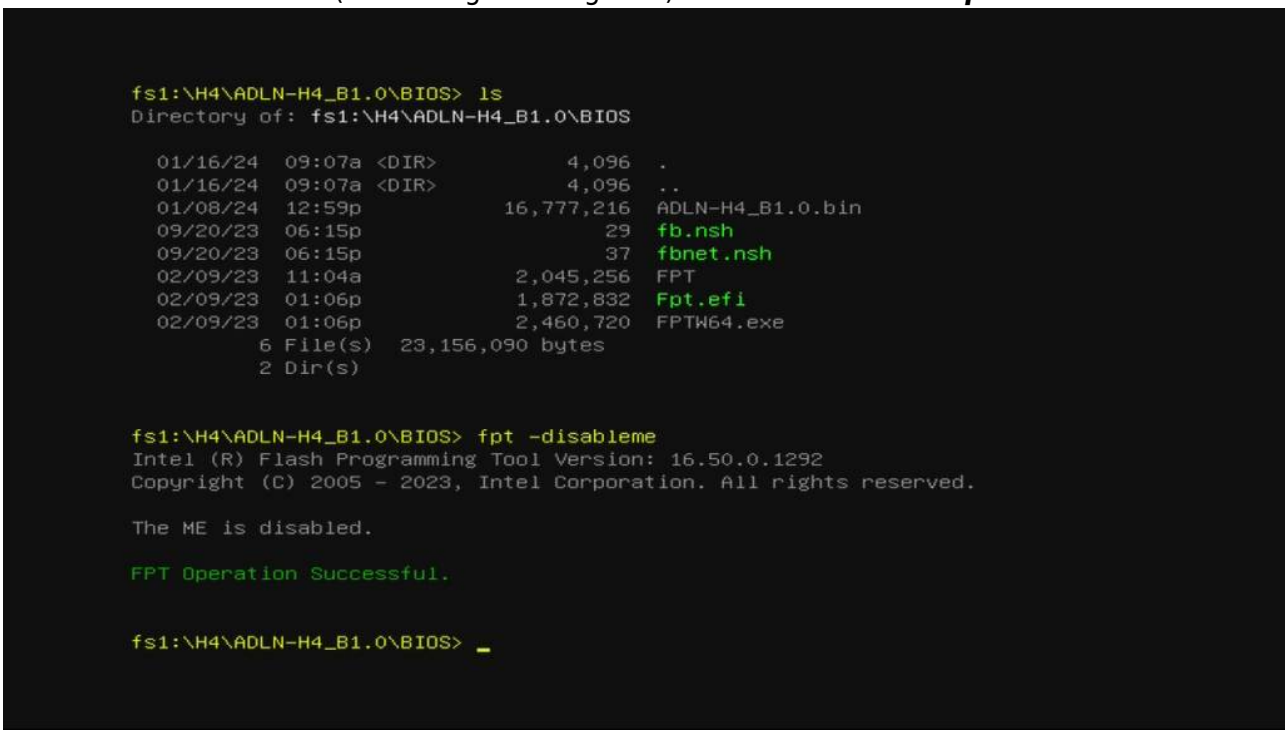
Or, Push F7 key right after the power button is pushed until shows us the picture below.



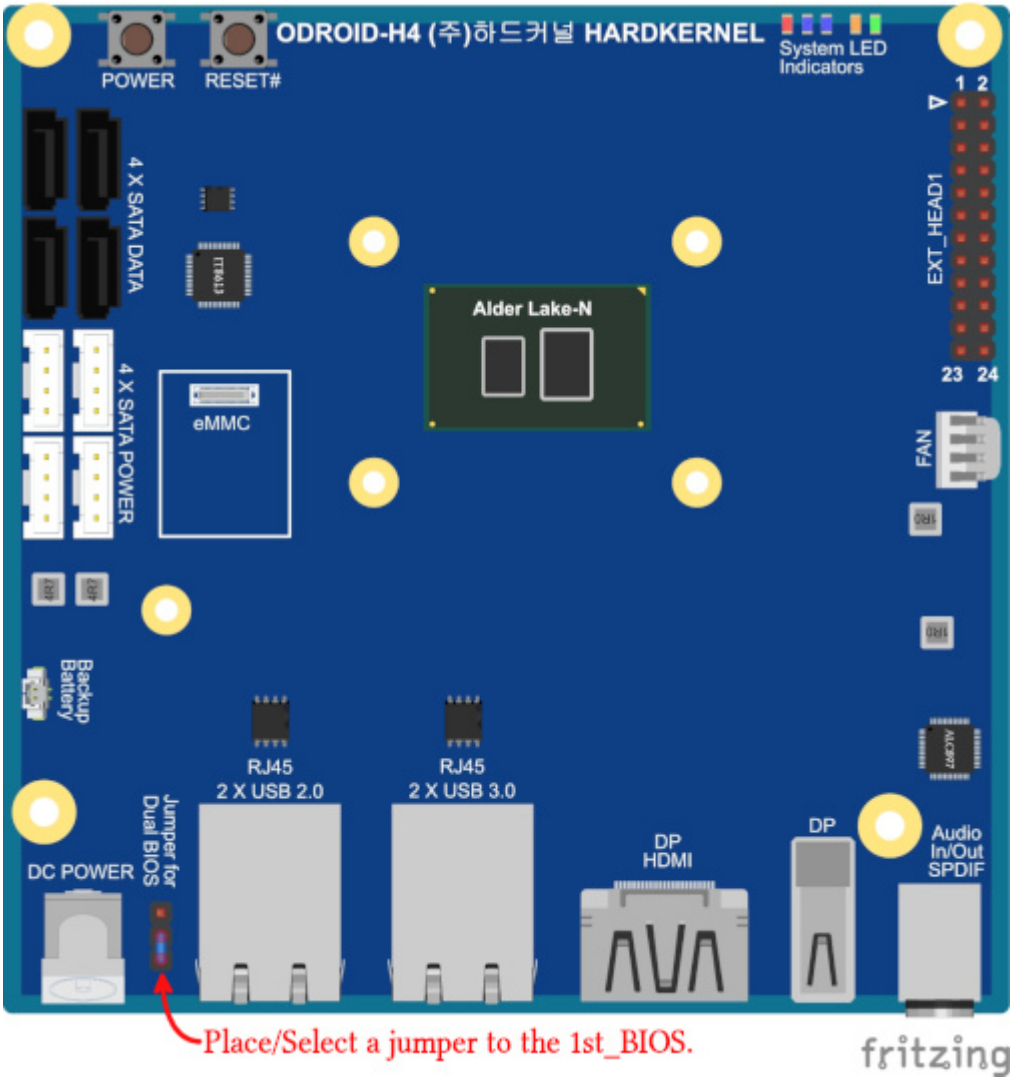
- **Step 2**. **Switch to your USB key drive**
  In the case of this, ***fs1*** is removable harddisk. Type ***fs1:*** *and change into your USB key drive.*



- **Step 3**. **Make disable ME**
  Go to location where FPT(Flash Programming Tool) file in there and run ***fpt -disableme***



- **Step 4**. **Change to failed BIOS by moving a jumper**
  Move a jumper to select the failed BIOS.
  In the image below, the 1st_BIOS will be restored. **(No jumper pin on the header pin is the same as selecting the 1st_BIOS)**



- **Step 5**. **Writing a firmware to the failed BIOS**
  Restore the BIOS you want. It is the same step as writing firmware to the SPI-ROM when you are updating BIOS.

```
blk1:\H4\ADLN-H4_B1.0\BIOS> fb
fb> Fpt.efi -f ADLN-H4_B1.0.bin
Intel (R) Flash Programming Tool Version: 16.50.0.1292
Copyright (C) 2005 - 2023, Intel Corporation. All rights reserved.

Reading HSFSTS register... Flash Descriptor: Valid

    --- Flash Devices Found ---
    ID:0xEF7018    Size: 16384KB (131072Kb)

GbE Region does not exist.

Processing Flash memory block   408 from  4095.
- Erasing Flash Block [0x199000] - 100 percent complete.
- Programming Flash [0x0199000]     4KB of     4KB - 100 percent complete.
Processing Flash memory block   586 from  4095.
- Erasing Flash Block [0x24B000] - 100 percent complete.
- Programming Flash [0x024B000]     4KB of     4KB - 100 percent complete.
Processing Flash memory block  1538 from  4095.
- Erasing Flash Block [0x603000] - 100 percent complete.
- Programming Flash [0x0603000]    12KB of    12KB - 100 percent complete.
Processing Flash memory block  2364 from  4095.
- Erasing Flash Block [0x93D000] - 100 percent complete.
- Programming Flash [0x093D000]  2808KB of  2808KB - 100 percent complete.
- Processed memory blocks 2442 from 4095.
```

- **Step 6**. **Writing has done & Reconnect the power code**
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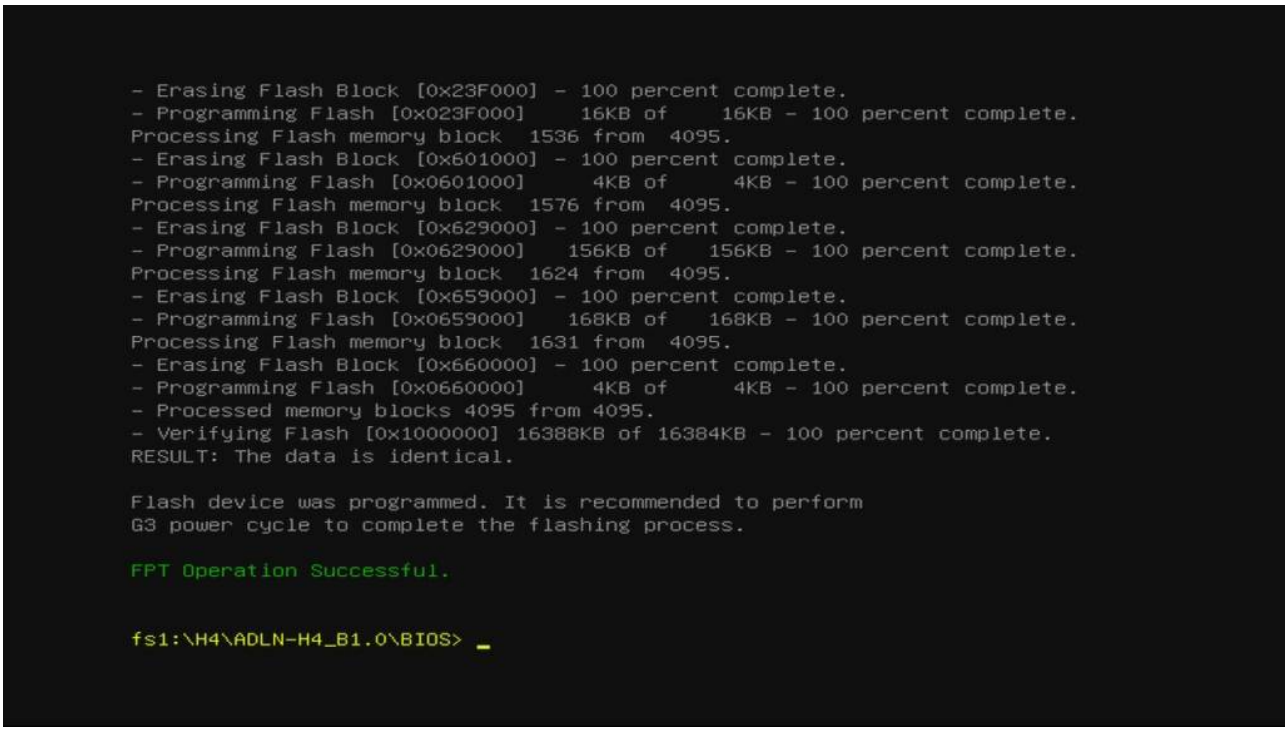
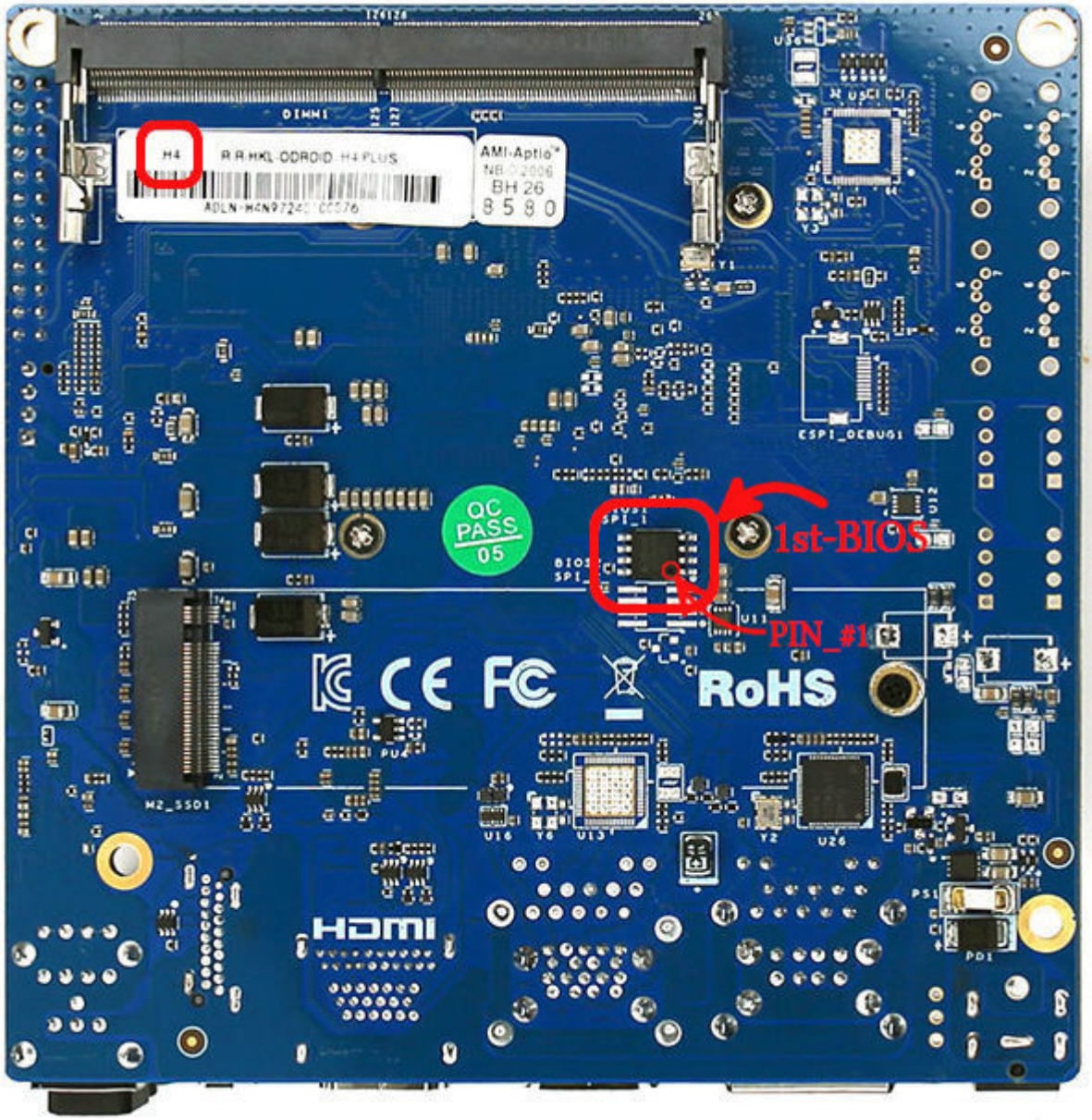


Using tool and soldering skills

In this step, it requires soldering skills and tools. It means that it would be possible to damage ODROID-H4 hardware-wise while you're doing this.

It is the same procedure as restoring H3. but, the location of SPI-ROM is the bottom of the PCB. Check it the below picture.
Please read carefully here in restoring H3. ☛ Go to the link.



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