



## BIOS Update Release Notes

**PRODUCTS: NUC8i7BEH, NUC8i5BEH, NUC8i5BEK, NUC8i3BEH, NUC8i3BEK, NUC8i7BEHGA, NUC8i7BEKQA, NUC8i5BEHFA, NUC8i5BEKPA, NUC8i3BEHFA**

**BIOS Version 0090 - BECFL357.86A.0090.2022.0916.1942**

### About This Release:

- Date: September 16, 2022
- ROM Image Checksum: 0xBCF8
- ME Firmware: 12.0.92.2145 (v3)
- EC Firmware: v3.26
- PMC Firmware: 300.1.20.1030
- I219 NVM: 0.4
- CRB Label: 1AUOK034
- Boot Guard ACM: 1.4.0
- BIOS Guard: Based on BiosGuard\_032
- Silicon initialization Code: Based on 7.0.51.41
- Memory Reference Code: 0,7,1,95
- Integrated Graphics:
  - Option ROM: v1026
  - UEFI Driver: v9.0.1098
- SATA RAID Option ROM: 17.8.0.1065
- AHCI Code: Based on AHCI\_17
- LAN Option ROM: PXE V0.1.1.3
- Visual BIOS: 2.2.23
- Supported Flash Devices:

|            |                    |             |
|------------|--------------------|-------------|
| WinBond    | W25Q128JVS1Q       | 16MB (3.3V) |
| Macronix   | MX25L12873FM2I-10G | 16MB (3.3V) |
| GigaDevice | GD25B127DSIGR      | 16MB (3.3V) |
- Microcode Updates included in .ROM & .BIO Files:
  - MC0806EA\_000000B4.mcb
  - MC0806EA\_000000EC.pdb

### Features Change/ Update:

- Updated ME FW to 12.0.92.2145 (v3).
- Fixed issue where POST hotkey message does not display when Secure Boot is Enabled.
- Added Enable TCO timer standard token.
- Fixed issue where Unauthorized modification of UEFI variables could overwrite arbitrary SMRAM.
- Fixed issue where Unauthorized modification of UEFI variables could disable the protect mechanism of SMM.
- Fixed issue where Unauthorized modification of UEFI variables.
- Fixed issue where Privilege escalation vulnerability from kernel to SMM in multiple devices.
- Updated CPU Microcode (0xEC) for IPU 2021.2

\*Other names and brands may be claimed as the property of others.

- Updated patch will assert at all conditions, confirmed to remove from the project.
- Updated for 2021.2 IPU BIOS change.
- Fixed issue where ME minor version checking algorithm issue.
- Fixed issue where No Boot after the BIOS update via WU issue.
- Fixed issue where system can't boot up after changing settings issue.
- Fixed issue where BIOS "Enhanced Consumer IR" item incorrect value when under normal mode issue.

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| <b>BIOS Version 0089 - BECFL357.86A.0089.2021.0621.1343</b> |
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#### **About This Release:**

- Date: June 21, 2021
- ROM Image Checksum: 0xEDB5
- ME Firmware: 12.0.81.1753
- EC Firmware: v3.26
- Memory Reference Code: Based on 7.0.51.41
- Integrated Graphics:
  - Option ROM: v1026
  - UEFI Driver: v9.0.1098
- SATA RAID Option ROM: 17.8.0.1065
- AHCI Code: Based on AHCI\_17
- LAN Option ROM: PXE V0.1.1.3
- Visual BIOS: 2.2.23
- Supported Flash Devices:
 

|            |                    |             |
|------------|--------------------|-------------|
| WinBond    | W25Q128JVSIQ       | 16MB (3.3V) |
| Macronix   | MX25L12873FM2I-10G | 16MB (3.3V) |
| GigaDevice | GD25B127DSIGR      | 16MB (3.3V) |
- Microcode Updates included in .ROM & .BIO Files:
 

|                       |
|-----------------------|
| MC0806EA_000000B4.mcb |
| MC0806EA_000000EA.pdb |

#### **New Fixes/Features:**

- Fixed issue with OFBD module SMI handler vulnerabilities.
- Updated CPU Microcode Firmware to 0xEA for IPU2021.1
- Fixed issue where after pressing "F10" for One Time Boot menu, pressing ESC key did not exit menu.
- Added protection code for unauthorized write at controllable address in SMRAM.
- Fixed issue to achieve arbitrary write in SMRAM save state region.

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| <b>BIOS Version 0088 - BECFL357.86A.0088.2021.0330.1431</b> |
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#### **About This Release:**

- Date: March 30, 2021
- ROM Image Checksum: 0x9479
- ME Firmware: 12.0.81.1753
- EC Firmware: v3.26
- Memory Reference Code: Based on 7.0.51.41
- Integrated Graphics:

\*Other names and brands may be claimed as the property of others.

- Option ROM: v1026
- UEFI Driver: v9.0.1098
- SATA RAID Option ROM: 17.8.0.1065
- AHCI Code: Based on AHCI\_17
- LAN Option ROM: PXE V0.1.1.3
- Visual BIOS: 2.2.23
- Supported Flash Devices:
 

|            |                    |             |
|------------|--------------------|-------------|
| WinBond    | W25Q128JVS IQ      | 16MB (3.3V) |
| Macronix   | MX25L12873FM2I-10G | 16MB (3.3V) |
| GigaDevice | GD25B127DSIGR      | 16MB (3.3V) |
- Microcode Updates included in .ROM & .BIO Files:
 

|                       |
|-----------------------|
| MC0806EA_000000B4.mcb |
| MC0806EA_000000E0.pdb |

#### **New Fixes/Features:**

- Updated ME Firmware version to 12.0.81.1753.
- Fixed issue when changing VR Temp to CPU Temp in performance monitor.
- Updated NTFS DXE driver when parsing NTFS file system partition.
- Update BIOS code for security fixes.

#### **Known Errata:**

- Due to the Intel® ME firmware update in BIOS version 0088, you can't downgrade to version 0087 or earlier.

### **BIOS Version 0087 - BECFL357.86A.0087.2020.1209.1115**

#### **About This Release:**

- Date: December 09, 2020
- ROM Image Checksum: 0x8B48
- ME Firmware: 12.0.71.1681
- EC Firmware: v3.26
- Memory Reference Code: Based on 7.0.51.41
- Integrated Graphics:
  - Option ROM: v1026
  - UEFI Driver: v9.0.1098
- SATA RAID Option ROM: 17.8.0.1065
- AHCI Code: Based on AHCI\_17
- LAN Option ROM: PXE V0.1.1.3
- Visual BIOS: 2.2.23
- Supported Flash Devices:
 

|            |                    |             |
|------------|--------------------|-------------|
| WinBond    | W25Q128JVS IQ      | 16MB (3.3V) |
| Macronix   | MX25L12873FM2I-10G | 16MB (3.3V) |
| GigaDevice | GD25B127DSIGR      | 16MB (3.3V) |

\*Other names and brands may be claimed as the property of others.

- Microcode Updates included in .ROM & .BIO Files:  
MC0806EA\_000000B4.mcb  
MC0806EA\_000000E0.pdb

#### **New Fixes/Features:**

- Updated FITC tools.
- Updated ME Firmware to 12.0.71.1681
- Updated EC Firmware to 3.26
- Fixed issue where HDD LED kept lighting.
- Update BIOS code for security fixes.

#### **Known Errata:**

- Due to the Intel® ME firmware update in BIOS version 0087, you can't downgrade to version 0085 or earlier.

### **BIOS Version 0085 - BECFL357.86A.0085.2020.1007.1917**

#### **About This Release:**

- Date: October 07, 2020
- ROM Image Checksum: 0x3170
- ME Firmware: 12.0.68.1606
- EC Firmware: v3.25
- Memory Reference Code: Based on 7.0.51.41
- Integrated Graphics:  
Option ROM: v1026  
UEFI Driver: v9.0.1098
- SATA RAID Option ROM: 17.8.0.1065
- AHCI Code: Based on AHCI\_17
- LAN Option ROM: PXE V0.1.1.3
- Visual BIOS: 2.2.23
- Supported Flash Devices:
 

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|------------|--------------------|-------------|
| WinBond    | W25Q128JVSIG       | 16MB (3.3V) |
| Macronix   | MX25L12873FM2I-10G | 16MB (3.3V) |
| GigaDevice | GD25B127DSIGR      | 16MB (3.3V) |
- Microcode Updates included in .ROM & .BIO Files:  
MC0806EA\_000000B4.mcb  
MC0806EA\_000000D6.pdb

#### **New Fixes/Features:**

- Fixed issue that made system fans spin over 3000 RPM regardless of workload.

### **BIOS Version 0083 - BECFL357.86A.0083.2020.0730.1436**

#### **About This Release:**

- Date: July 30, 2020
- ROM Image Checksum: 0xE4C0
- ME Firmware: 12.0.68.1606
- EC Firmware: v3.25
- Memory Reference Code: Based on 7.0.51.41
- Integrated Graphics:  
Option ROM: v1026

\*Other names and brands may be claimed as the property of others.

UEFI Driver: v9.0.1098

- SATA RAID Option ROM: 17.8.0.1065
- AHCI Code: Based on AHCI\_17
- LAN Option ROM: PXE V0.1.1.3
- Visual BIOS: 2.2.23
- Supported Flash Devices:

|            |                    |             |
|------------|--------------------|-------------|
| WinBond    | W25Q128JVSIQ       | 16MB (3.3V) |
| Macronix   | MX25L12873FM2I-10G | 16MB (3.3V) |
| GigaDevice | GD25B127DSIGR      | 16MB (3.3V) |
- Microcode Updates included in .ROM & .BIO Files:

|                       |
|-----------------------|
| MC0806EA_000000B4.mcb |
| MC0806EA_000000D6.pdb |

#### **New Fixes/Features:**

- Fixed issue where "Optane cannot work after BIOS recovery".
- Fixed issue with "Kernel DMA protection".
- Fixed issue where Thunderbolt boot was disabled after POST time improvement.
- Updated BIOS code for security fixes.
- Updated ME Firmware to 12.0.68.1606
- Update EC Firmware to v3.25.

#### **Known Errata:**

- Due to the Intel® ME firmware update in BIOS version 0083, you can't downgrade to version 0081 or earlier.

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| <b>BIOS Version 0081 - BECFL357.86A.0081.2020.0504.1834</b> |
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#### **About This Release:**

- Date: May 04, 2020
- ROM Image Checksum: 0xC513
- ME Firmware: 12.0.47.1524
- EC Firmware: v3.20
- Memory Reference Code: Based on 7.0.51.41
- Integrated Graphics:
  - Option ROM: v1026
  - UEFI Driver: v9.0.1098
- SATA RAID Option ROM: 17.8.0.1065
- AHCI Code: Based on AHCI\_17
- LAN Option ROM: PXE V0.1.1.3
- Visual BIOS: 2.2.23
- Supported Flash Devices:

|            |                    |             |
|------------|--------------------|-------------|
| WinBond    | W25Q128JVSIQ       | 16MB (3.3V) |
| Macronix   | MX25L12873FM2I-10G | 16MB (3.3V) |
| GigaDevice | GD25B127DSIGR      | 16MB (3.3V) |
- Microcode Updates included in .ROM & .BIO Files:

|                                |
|--------------------------------|
| MC0806EA_0000009D_000000B4.pdb |
| MC0806EA_000000CA.pdb          |

#### **New Fixes/Features:**

- Fixed issue with "clear security password" message.

\*Other names and brands may be claimed as the property of others.

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| <b>BIOS Version 0079 - BECFL357.86A.0079.2020.0424.1838</b> |
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**About This Release:**

- Date: April 24, 2020
- ROM Image Checksum: 0x2B0B
- ME Firmware: 12.0.47.1524
- EC Firmware: v3.20
- Memory Reference Code: Based on 7.0.51.41
- Integrated Graphics:
  - Option ROM: v1026
  - UEFI Driver: v9.0.1098
- SATA RAID Option ROM: 17.8.0.1065
- AHCI Code: Based on AHCI\_17
- LAN Option ROM: PXE V0.1.1.3
- Visual BIOS: 2.2.23
- Supported Flash Devices:

|            |                    |             |
|------------|--------------------|-------------|
| WinBond    | W25Q128JVSIQ       | 16MB (3.3V) |
| Macronix   | MX25L12873FM2I-10G | 16MB (3.3V) |
| GigaDevice | GD25B127DSIGR      | 16MB (3.3V) |
- Microcode Updates included in .ROM & .BIO Files:

|                                |
|--------------------------------|
| MC0806EA_0000009D_000000B4.pdb |
| MC0806EA_000000CA.pdb          |

**New Fixes/Features:**

- Fixed issue with SMM arbitrary code execution due to insufficient buffer validation.
- Fixed sleep mode issue by lock MFG mode.
- Fixed issue with USB2 port.
- Fixed issue where Crucial SSD would hang at the Intel NUC logo splash screen.
- Removed "RAM Disk Configuration" setup question.

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| <b>BIOS Version 0078 - BECFL357.86A.0078.2020.0309.1538</b> |
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**About This Release:**

- Date: March 09, 2020
- ROM Image Checksum: 0x3767
- ME Firmware: 12.0.47.1524
- EC Firmware: v3.20
- Memory Reference Code: Based on 7.0.51.41
- Integrated Graphics:
  - Option ROM: v1026
  - UEFI Driver: v9.0.1098
- SATA RAID Option ROM: 17.8.0.1065
- AHCI Code: Based on AHCI\_17
- LAN Option ROM: PXE V0.1.1.3
- Visual BIOS: 2.2.23
- Supported Flash Devices:

|          |                    |             |
|----------|--------------------|-------------|
| WinBond  | W25Q128JVSIQ       | 16MB (3.3V) |
| Macronix | MX25L12873FM2I-10G | 16MB (3.3V) |

\*Other names and brands may be claimed as the property of others.

GigaDevice    GD25B127DSIGR    16MB (3.3V)

- Microcode Updates included in .ROM & .BIO Files:  
    MC0806EA\_0000009D\_000000B4.pdb  
    MC0806EA\_000000C6.pdb

**New Fixes/Features:**

- Updated the RAID Driver version to 17.8.0.1065
- Fixed issue with BIOS stress tests.
- Fixed issue where NUC logo freezes when connecting TBT monitor and HDMI monitor at the same time.
- Fixed issue regarding USB connector naming for BE products.
- Fixed issue regarding failure to PXE boot.
- Fixed issue regarding checking performance monitor and fan control mode.
- Updated BIOS code for security fixes.

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| <b>BIOS Version 0077 - BECFL357.86A.0077.2019.1127.1452</b> |
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**About This Release:**

- Date: Nov 27, 2019
- ROM Image Checksum: 0x6B9A
- ME Firmware: 12.0.47.1524
- EC Firmware: v3.20
- Memory Reference Code: Based on 7.0.51.41
- Integrated Graphics:
  - Option ROM: v1026
  - UEFI Driver: v9.0.1098
- SATA RAID Option ROM: 16.8.0.1000
- AHCI Code: Based on AHCI\_17
- LAN Option ROM: PXE V0.1.1.3
- Visual BIOS: 2.2.23
- Supported Flash Devices:

|            |                    |             |
|------------|--------------------|-------------|
| WinBond    | W25Q128JVSIG       | 16MB (3.3V) |
| Macronix   | MX25L12873FM2I-10G | 16MB (3.3V) |
| GigaDevice | GD25B127DSIGR      | 16MB (3.3V) |
- Microcode Updates included in .ROM & .BIO Files:  
    MC0806EA\_0000009D\_000000B4.pdb  
    MC0806EA\_000000C6.pdb

**New Fixes/Features:**

- Updated ME to 12.0.47.1524.
- Fixed issue where "Chassis value type changed during flash by BIO" for Microsoft request
- Fixed issue with auto detect Thunderbolt device.
- Fixed issue with basic standard speed performance.
- Fixed issue where "SMBIOS Field update BIOS" for Microsoft request.
- Fixed issue with Thunderbolt controller.
- Fixed issue finding Bluetooth device.
- Fixed issue waking up Bluetooth in Legacy mode.

\*Other names and brands may be claimed as the property of others.

- Due to ME Firmware update cannot downgrade to BIOS 0075 or previous

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| <b>BIOS Version 0075 - BECFL357.86A.0075.2019.1023.1448</b> |
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**About This Release:**

- Date: Oct 23, 2019
- ROM Image Checksum: 0xB961
- ME Firmware: 12.0.32.1421
- EC Firmware: v3.20
- Memory Reference Code: Based on 7.0.44.23
- Integrated Graphics:
  - Option ROM: v1017
  - UEFI Driver: v9.0.1084
- SATA RAID Option ROM: 16.8.0.1000
- AHCI Code: Based on AHCI\_17
- LAN Option ROM: PXE V0.1.1.3
- Visual BIOS: 2.2.23
- Supported Flash Devices:
 

|            |                    |             |
|------------|--------------------|-------------|
| WinBond    | W25Q128JVSIQ       | 16MB (3.3V) |
| Macronix   | MX25L12873FM2I-10G | 16MB (3.3V) |
| GigaDevice | GD25B127DSIGR      | 16MB (3.3V) |
- Microcode Updates included in .ROM & .BIO Files:
 

|                                |
|--------------------------------|
| MC0806EA_0000009D_000000B4.pdb |
| MC0806EA_000000C6.pdb          |

**New Fixes/Features:**

- Fixed issue where changes to "Native ACPI OS PCIe Support" setting in BIOS doesn't stay.
- Implemented security fixes.
- Updated processor microcode to MC0806EA\_000000C6.pdb

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| <b>BIOS Version 0074 - BECFL357.86A.0074.2019.0916.1548</b> |
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**About This Release:**

- Date: September 16, 2019
- ROM Image Checksum: 0x4B57
- ME Firmware: 12.0.32.1421
- EC Firmware: v3.20
- Memory Reference Code: Based on 7.0.44.23
- Integrated Graphics
  - Option ROM: v1017
  - UEFI Driver: v9.0.1084
- SATA RAID Option ROM: 16.8.0.1000
- AHCI Code: Based on AHCI\_17
- LAN Option ROM: PXE V0.1.1.3
- Visual BIOS: 2.2.23
- Supported Flash Devices:
 

|            |                    |             |
|------------|--------------------|-------------|
| WinBond    | W25Q128JVSIQ       | 16MB (3.3V) |
| Macronix   | MX25L12873FM2I-10G | 16MB (3.3V) |
| GigaDevice | GD25B127DSIGR      | 16MB (3.3V) |
- Microcode Updates included in .ROM File:
 

|                                |
|--------------------------------|
| MC0806EA_0000009D_000000B4.pdb |
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- Additional Microcode Updates included only in .BIO File:

#### **New Fixes/Features:**

- Fixed issue where Watchdog feature is triggered during stress testing.
- Updated BIOS code for BIOS recovery with USB flash drive.
- Updated Chassis type default to 0x23.
- Updated BIOS code for security fixes.

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| <b>BIOS Version 0073 - BECFL357.86A.0073.2019.0618.1409</b> |
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#### **About This Release:**

- Date: June 18, 2019
- ROM Image Checksum: 0xF0F3
- ME Firmware: 12.0.32.1421
- EC Firmware: v3.20
- Memory Reference Code: Based on 7.0.44.23
- Integrated Graphics:
  - Option ROM: v1017
  - UEFI Driver: v9.0.1084
- SATA RAID Option ROM: 16.8.0.1000
- AHCI Code: Based on AHCI\_17
- LAN Option ROM: PXE V0.1.1.3
- Visual BIOS: 2.2.23
- Supported Flash Devices:
 

|            |                    |             |
|------------|--------------------|-------------|
| WinBond    | W25Q128JVS IQ      | 16MB (3.3V) |
| Macronix   | MX25L12873FM2I-10G | 16MB (3.3V) |
| GigaDevice | GD25B127DSIGR      | 16MB (3.3V) |
- Microcode Updates included in .ROM & .BIO Files:
 

|                                |
|--------------------------------|
| MC0806EA_0000009D_000000B4.pdb |
|--------------------------------|

#### **New Fixes/Features:**

- Fixed issue: Keeping monitor off when WOL from S3.
- Fixed issue: Thunderbolt Hot-plugging doesn't work when you use Legacy in the BIOS.
- Fixed issue: Blue USB 3.0 port have 5V every time when system AC power turn on/turn off.
- Updated Microcode to version MC0806EA\_0000009D\_000000B4.pdb.
- Remove the option "SW Control" on "RGB LED" and "Button LED" items.

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| <b>BIOS Version 0071 - BECFL357.86A.0071.2019.0510.1505</b> |
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#### **About This Release:**

- Date: May 10, 2019
- ME Firmware: 12.0.32.1421
- EC Firmware: v3.20
- PMC Firmware: 300.1.20.1023
- Framework Reference Code: Based on 7.0.44.23
- Memory Reference Code: Based on 7.0.44.23
- Integrated Graphics:
  - Option ROM: v1017
  - UEFI Driver: v9.0.1084
- SATA RAID Option ROM: 16.8.0.1000

\*Other names and brands may be claimed as the property of others.

- AHCI Code: Based on AHCI\_17
- LAN Option ROM: PXE V0.1.1.3
- Visual BIOS: 2.2.23

#### **New Fixes/Features:**

- Fixed the issue that caused the SSD password to stop working after updating to BIOS 0064 or 0066.
- Fixed the issue where the fan settings wouldn't change when changing the "Fan Control Mode" to/from Balanced to Cool.
- Fixed the issue where wireless is disabled in the BIOS but still appears in Windows device manager.
- Changed RING LED to RGB LED in the BIOS to match the motherboard silkscreen and Technical Product Specification.
- Fixed the issue with the password prompt when BitLocker is enabled.
- Updated the BIOS code for security fixes.
- Updated Intel ME firmware to version 12.0.23.1311.
- Fixed issue when keyboard/mouse is connected to Type-C port.
- Removed option for 2048MB on IGD Aperture Size setting.
- Fixed issue where HDD password feature doesn't show in the setup menu with NVME PCIe drive.
- Updated S3 Indicator blinking behavior.
- Update Graphics Option ROM to version 1017.
- Updated Graphics UEFI driver to version 9.0.1084.
- Updated RAID Option ROM to version 16.8.0.1000.

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| <b>BIOS Version 0051 - BECFL357.86A.0051.2018.1015.1513</b> |
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#### **About This Release:**

- Date: October 15, 2018
- ME Firmware: 12.0.10.1128
- EC Firmware: v3.20
- PMC Firmware: 300.1.20.1019
- Framework Reference Code: Based on 7.0.37.50
- Integrated Graphics:
  - Option ROM: v1014
  - UEFI Driver: v9.0.1080
- LAN Option ROM: PXE v0.1.1.3
- Visual Bios: 2.2.23

#### **New Fixes/Features:**

- Fixed issue where the startup sound causes error in Device Manager.
- Updated Intel® ME firmware to version 1128.
- Updated PMC firmware to version 1019.
- Updated EC firmware to version 3.20 to fix LED behavior issue.
- Updated processor support.
- Fixed issue where remove storage password causes drive to disappear from boot manager.
- Updated watchdog event to be triggered by recovery.

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| <b>BIOS Version 0048 - BECFL357.86A.0048.2018.0919.2013</b> |
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#### **About This Release:**

\*Other names and brands may be claimed as the property of others.

- Date: September 19, 2018
- ME Firmware: 12.0.5.1117
- EC Firmware: v3.18
- PMC Firmware:v300.1.20.1015
- Framework Reference Code: Based on 7.0.37.50
- Integrated Graphics:
  - Option ROM: v1014
  - UEFI Driver: v9.0.1080
- LAN Option ROM: PXE v0.1.1.3
- Visual Bios: 2.2.23

#### **New Fixes/Features:**

- Updated EC Firmware to version 3.18.
- Updated BIOS item Wake from Sleep State via CIR.
- Fixed issue where power LED had abnormal behavior when system enters S4 states in modern standby mode.
- Fixed issue where system can't enter Modern Standby if NVME device is installed.

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| <b>BIOS Version 0041 - BECFL357.86A.0041.2018.0719.1931</b> |
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#### **About This Release:**

- Date: July 19, 2018
- ME Firmware: 12.0.5.1117
- EC Firmware: v3.14
- PMC Firmware:v300.1.20.1015
- Framework Reference Code: Based on 7.0.37.50
- Integrated Graphics:
  - Option ROM: v1014
  - UEFI Driver: v9.0.1080
- LAN Option ROM: PXE V0.1.1.3
- Visual Bios: 2.2.23

#### **New Fixes/Features:**

- Initial production BIOS release

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