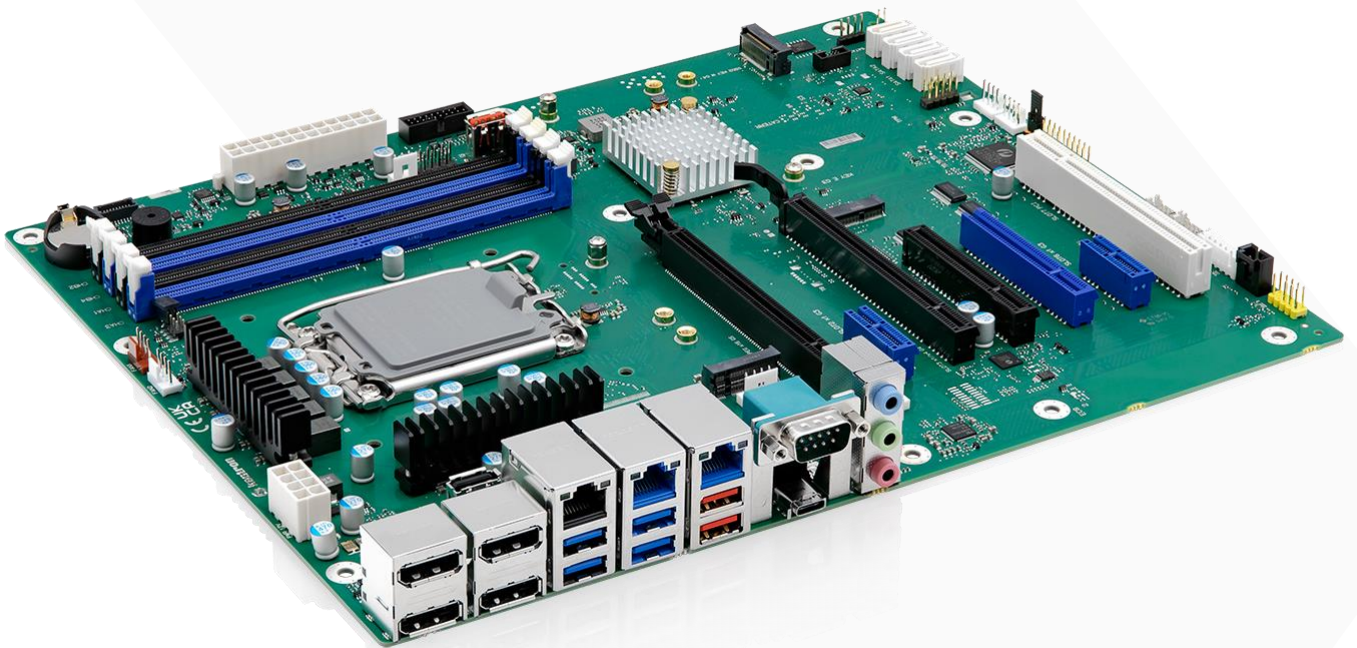


BIOS Release Notes

Intel® RaptorLake-S (R2.*.0)



ATX Series

➤ K3851-R ATX

Revision History

Revision	Change description	Date
V1.0	First mass production release R2.1.0 for K3851-R.	2023-03-02
V1.1	New BIOS Release R2.9.0 for K3851-R	2023-06-01

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1 General Notes

1.1 Released OS versions

- MS Windows 10 (64bit, 21H2 LTSC)
- MS Windows 11 (64bit, 10.0.22000)
- Linux¹ (64bit, Kernel 5.15)²

1.2 Released drivers

An overview about released drivers for Alderlake-S / Raptorlake-S platform is available on FTP server. Just click on the links in the HTML file to download the driver packages.

<https://ftp.kontron.com/main.html?download&weblink=df7c2cc9071f16aec4ce07823520318a&realfilename=Drivers%5FADL%2Ehtml>

1.3 Datasheets

- K3851-R:
<https://ftp.kontron.com/main.html?download&weblink=df7c2cc9071f16aec4ce07823520318a&subfolder=Documentation&realfilename=DS%5FK3851%2DR%5FATX%2Epdf>

1.4 Product change notification

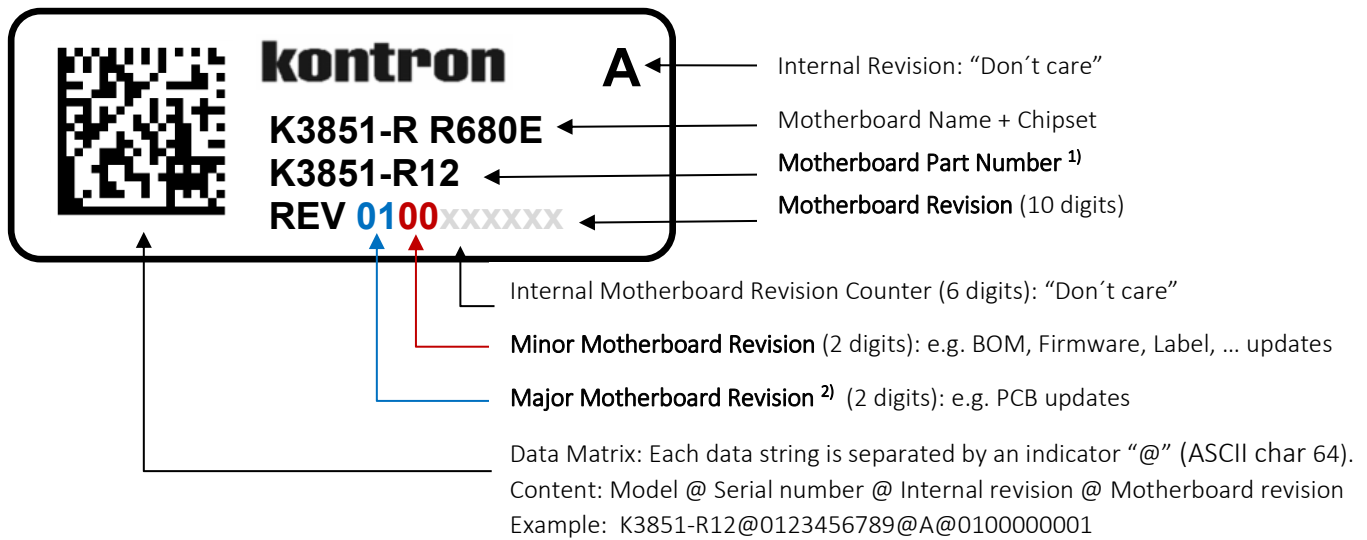
Product related changes communicated through “Product Change Notification” (PCN) on FTP server:

- K3851-R:
<https://ftp.kontron.com/main.html?download&weblink=df7c2cc9071f16aec4ce07823520318a&subfolder=PCN>

¹ Running test only – no full approval!

² Tested with Ubuntu 22.04 LTS. Ubuntu is a trademark of Canonical Limited. For specific support, please contact Canonical.

1.5 Motherboard labeling and revision scheme



1) Motherboard part number example:

- K3851-R12:
 - **K3851**-R12: Kontron boards family (technology based family)
 - K38**51**-R12: Formfactor and board variant
 - K3851-R**12**: Number for derivate of board variant
 - K3851-R1**2**: PCB version

2) Major revision is always "01" for first release to manufacturing, even "PCB version" on the revision label (Q1**2**) indicates that this is already the second PCB version.

For evaluation/pre-production motherboards the major revision is marked with alphabetic letters (0A, 0B, ...).

Example:

Development revision of K3851-R1 motherboard: **0B**04xxxxxx

Initial released motherboard revision: **01**00xxxxxx

2 BIOS Update Options

NOTICE

Beginning with K38xx motherboards AMI AFU update utility is used. **Eflash.efi** and **Deskflash** (Windows, Linux) are not supported by K38xx motherboards.

Kontron provides ready-to-run update script files for EFI shell and Windows batch. Please follow the screen instructions carefully.

WARNING

Using other AFU parameters as defined in update script file may result in data loss in UEFI BIOS!

2.1 EFI based update

Use ZIP-file for EFI-based BIOS Update

1. Copy all content of *Kxxx-Yzz.R1.*.O.zip* to the root folder of a FAT32 formatted USB drive/stick.
2. Switch on system and boot to UEFI shell. The EFI autostart script (**startup.nsh**) find and selects the BIOS update stick and starts the update process by calling **update-efi.nsh**.
3. Carefully read and follow the screen instructions.

2.2 Windows based update

Use ZIP-file for Windows-based BIOS Update

1. Extract all content of *Kxxx-Yzz.R1.*.O.zip* to any folder on your local drive.
2. Start the BIOS update with included script "**update-win.bat**" (run as administrator)
3. Carefully read and follow the screen instructions.

2.3 Updating Intel ME and Kontron Embedded Controller (EC)

ME and EC Firmware are placed in protected areas of BIOS and therefore additional (manual or semi-automated) steps to enable update capability may be required.

ME firmware update is part of the standard BIOS update script (**update-efi** / **update-win**) via FWUpdLcl tool.

For updating EC firmware please use the dedicated update script:

- EFI: **ec-update-efi.nsh**
- Windows: **ec-update-win.bat**

Follow the steps mentioned in "EFI/Windows based update" and execute the ec-update script in a separate step. Follow the screen instructions.

NOTICE

Downgrade of Intel ME firmware is blocked due to security policy of Intel. Kontron does not validate nor guarantee the function of BIOS/ME-Firmware combinations caused by a BIOS downgrade (e.g. old BIOS with latest ME firmware).

2.4 BIOS Recovery

WARNING

All BIOS settings and some data³ get lost during recovery process!

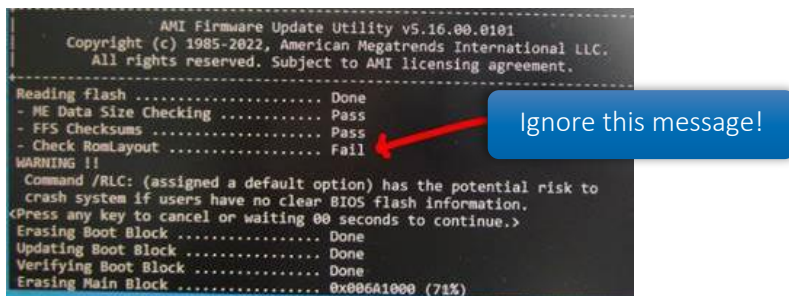
1. Copy the complete content of BIOS ZIP package (especially K*.ROM file) to a FAT32 formatted drive.
2. Connect prepared drive to the system and change the recovery jumper (on front panel header) to "Recovery" (orange) position (see [BIOS FlashTools HowTo](#) or TechNotes for details)
3. Disconnect all other drives. Power On the system. Instead of loading the BIOS code from NVRAM chip, system boots from ROM file content.
4. System enters a "BIOS setup"-like user interface. Confirm "Proceed with flash update" message.
5. Wait until "Updating main firmware" finished.
 - **Do not interrupt power or press any key during update!**
6. Set jumper back to its default position.
7. Press any key to reset the system. Check if system is working properly again.
8. Reconnect all drives and power on the system. Reconfigure BIOS with your requirements.

2.5 BIOS update error handling

If you discover any problems after a BIOS flash, please try if "Load Optimized Default Values" (F3) in BIOS Setup solves the problem.

2.6 Message "Check ROMLayout ... Fail"

If you encounter a message during BIOS update batch run with "Check RomLayout Fail" please treat this message only as information. AfuUpdate report this message if there is a ROM layout change in BIOS NVRAM, but the BIOS code can handle this change. **Do not interrupt or interact in this state with the console or shell.**



```

AMI Firmware Update Utility v5.16.00.0101
Copyright (c) 1985-2022, American Megatrends International LLC.
All rights reserved. Subject to AMI licensing agreement.

Reading flash ..... Done
- ME Data Size Checking ..... Pass
- FFS Checksums ..... Pass
- Check RomLayout ..... Fail
WARNING !!
Command /RLC: (assigned a default option) has the potential risk to
crash system if users have no clear BIOS flash information.
(Press any key to cancel or waiting 00 seconds to continue.)
Erasing Boot Block ..... Done
Updating Boot Block ..... Done
Verifying Boot Block ..... Done
Erasing Main Block ..... 0x00641000 (71%)
  
```

2.7 Customer Service Release BIOS

Besides the released BIOS versions there may be additional BIOS versions (Customer Service Release BIOS = CSR BIOS) that solve specific customer problems or provide important interims bug fixes.

Please note: These versions are not pre-installed ex factory.

³ SystemData item „BSOC“ not affected by BIOS recovery.

2.8 Modify BIOS Setup Settings and Defaults (GabiSettings.efi, Biosset)

BIOS settings can be modified by the Windows and Linux tool “Biosset” (Modify BIOS Setup Settings and Defaults). See Biosset tool help (parameter -h) for further details.

For EFI shell environment, you can use GabiSettings.efi tool.

For more details about these tools, please have a look in our *Manufacturing-Tools HowTo* document. To see, which tools are supported by each motherboard, check “PCMB Toolsupport Matrix”.

Both documents are available on FTP server:

https://ftp.kontron.com/main.html?download&weblink=3cb83a90a99c51160d2aa1f1f34cc340&subfolder=Services/Software_Tools/Common-Mainboard-Tools

Access to these tools is restricted to direct customers, distributors and system builder.

2.9 What's about DOS support and where are the DOS tools?

There is no “Legacy” OS support (CSM mode) implemented. Only UEFI based operating systems are supported. We provide tools and documentation for Windows, Linux and EFI:

https://ftp.kontron.com/main.html?download&weblink=3cb83a90a99c51160d2aa1f1f34cc340&subfolder=Services/Software_Tools/Common-Mainboard-Tools

3 Released BIOS versions

3.1 UEFI core version

- AMI Aptio V5.0.0.27

3.2 BIOS Download

- K3851-R:
https://ftp.kontron.com/main.html?download&weblink=df7c2cc9071f16aec4ce07823520318a&subfolder=BIOS_K3851

3.3 BIOS R2.1.0

First released mass production BIOS for K3851-R board.

Firmware Versions			
Microcode	AlderLake-S C0/K0 (90672):	0x2C	
	AlderLake-S K0 (90675):	0x1E	
	RaptorLake-S B0 (B0671):	0x112	
	RaptorLake-S C0 (B0672):	0x20	
	RaptorLake-S H0 (B0675):	0x20	
Memory RC	0.0.4.103	Intel CSME	16.1.25.2020
Intel GOP	17.0.1077	Emb. Controller (EC)	2.9.0
LAN i219	0.2.02	LAN i225	0.9.03

Changed items compared to previous version highlighted in light yellow.

- Several bug fixes compared to latest BIOS evaluation version.

3.4 BIOS R2.9.0

Firmware Versions			
Microcode	AlderLake-S C0/K0 (90672):	0x32	
	AlderLake-S K0 (90675):	0x1E	
	RaptorLake-S B0 (B0671):	0x119	
	RaptorLake-S C0 (B06F2):	0x20	
	RaptorLake-S H0 (B06F5):	0x20	
Memory RC	0.0.4.112	Intel CSME	16.1.25.2101
Intel GOP	17.0.1081	Emb. Controller (EC)	2.10.0
LAN i219	0.2.02	LAN i225	0.9.03

Changed items compared to previous version highlighted in light yellow.

- Updated: CPU Microcodes and Memory Reference Code.
- Updated: Embedded Controller Firmware.
- Updated: BIOS update scripts to allow “space” in filename/path.
- Fixed: Buzzer does not work in OS.
- Fixed: Some settings are not reverted to default after BIOS recovery update.
- Fixed: Missing Network boot device after TPM has been disabled in BIOS setup.
- Fixed: Missing Network boot device after EC Firmware update enabled in BIOS setup.
- Fixed: SetupItemIDs for PCIe Slot 5 & 6 ASPM setting missing.
- Fixed: USB keyboard/mouse not available in BIOS setup, if USB Port control is set to “Disable all port”.
- Fixed: Memory information not available in BIOS “System Information” page.
- Fixed: COM1 receive overrun error
- Fixed: Intrusion detection not working after power-off and reboot.
- Fixed: Set “Internal Graphics” to “Disabled” place the system in “no signal” state.
- Fixed: Unsupported “Embedded DisplayPort” setup page available – Removed.
- Fixed: BIOS Watchdog setting not available in BIOS.
- Fixed: PCI(e) slot numbering wrong in Device Manager.
- Fixed: PCIe Slot 4 and 5 mapping in BIOS switched between.
- Fixed: PEG slot bifurcation not working correctly.
 - It may be necessary to limit the PCIe link speed, depending on the used Riser and Endpoint design and signal quality.
- Fixed: Power Failure Recovery option “Disabled” is missing.
- Fixed: Intel ARC750/770 graphics not working (black screen)
- Fixed: Unknown device INT3472 displayed in Device manager.
 - It may be necessary to load BIOS default values after BIOS flash to update internal BIOS values.
- Fixed: BIOS Eventlog entries cannot be resolved (“Unrecognized”)
- Feature: Option to select USB-C current added to BIOS > Power tab.
- Feature: Add “System Firmware Update” and “System Firmware Rollback” BIOS option to control the BIOS update mechanism.

4 Known Limitations and Restrictions

4.1 Open

Found in	Type	Issue	Solved with
K3851-R12	Functional	COM3/COM4 limited feature set (no DCD/DTR/DSR/RI)	open (K3851-R13)
R2.1.0	Functional	Transfer BIOS settings currently not supported.	open
R2.1.0	Feature	TXT not yet implemented	open
R2.1.0	Feature	Intel TCC and TSN not yet validated Important: BIOS setup entry “ <i>Intel Time Coordinated Computing</i> ” is experimental and not yet validated. Any change in this menu can lead to a non-working motherboard! This setup item is subject of change in further BIOS updates. No SetupItemID support at the moment.	open

Changed items compared to previous version highlighted in light yellow.

4.2 Closed / Info

Found in	Type	Issue	Solved with
R2.1.0	Feature	SetupItemID for ASPM Slot5 and Slot6 setting is not yet implemented.	R2.9.0
R2.1.0	Functional	Network boot device not available after changing "EC Update" to "Enabled". (Only necessary during EC firmware update for one boot)	R2.9.0
R2.1.0	Functional	Intel ARC750/770 not working. Black screen on external graphics output.	R2.9.0
R2.1.0	Functional	Some devices are not working properly in upper slot in PEG port, if Bifurcation is activated (x8/x8)	R2.9.0
R2.9.0	CPU Feature	System doesn't enter CStates lower than C6	Info
R2.1.0	Functional	"Internal Graphics" setting is not re-enabled automatically if no external graphics card is connected. Plug-In an external graphics card and enable "Internal Graphics" manually.	Info

Changed items compared to previous version highlighted in light yellow.



About Kontron

Kontron is a global leader in IoT/Embedded Computing Technology (ECT). Kontron offers individual solutions in the areas of Internet of Things (IoT) and Industry 4.0 through a combined portfolio of hardware, software and services. With its standard and customized products based on highly reliable state-of-the-art technologies, Kontron provides secure and innovative applications for a wide variety of industries. As a result, customers benefit from accelerated time-to-market, lower total cost of ownership, extended product lifecycles and the best fully integrated applications.

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