



# Intel® Quartus® Prime Pro Edition

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## Version 23.2 Software and Device Support Release Notes

Updated for Intel® Quartus® Prime Design Suite: **23.2**



**Online Version**



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## 1. Intel® Quartus® Prime Pro Edition Version 23.2 Software and Device Support Release Notes

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This document provides late-breaking information about Intel® Quartus® Prime Pro Edition Version 23.2.

For additional information about this software release, refer to the Intel Quartus Prime Pro Edition README file in the following location: `<installation directory>/quartus/readme.txt`

For information about operating system support, refer to the following web page: [Intel FPGA Operating System Support](#).

### Related Information

- [Intel Quartus Prime Standard Edition Software and Device Support Release Notes](#)
- [Intel Quartus Prime Pro Edition Design Software for Linux](#)
- [Intel Quartus Prime Pro Edition Design Software for Windows](#)
- [Intel FPGA Software Installation and Licensing](#)

## 1.1. New Features and Enhancements

Intel Quartus Prime Pro Edition Software Version 23.2 includes functional and security updates. Keep your software up-to-date and follow the [technical recommendations](#) that help to improve the security of your Intel Quartus Prime installation.

Intel Quartus Prime Pro Edition Software Version 23.2 includes the following new features and enhancements:

- Added support for new Intel Agilex® 7 devices. For details, refer to [Changes in Device Support](#) on page 16.
- Enhanced Power and Thermal Calculator (PTC) as follows:
  - PTC GUI enhanced to include a **Select Device** button, which allows you to modify their device selection.
  - Hierarchy Manager enhanced to support bulk editing (with the new **Bulk Edit** button in the GUI) of hierarchical parameters.
  - PTC Main page enhanced to include a parameter and value table for the selected device.
  - I/O page enhanced to include the **Voltage setting for unused HVIO banks** field. While this field is visible for Intel Agilex 7 devices, values can be set only for Intel Agilex 5 devices.
  - The **Transceivers** page of the Power and Thermal Calculator added a **RX Adaptation** column

### Bug Fixes

Intel Quartus Prime Pro Edition Software Version 23.2 also include bug fixes. Review [Software Issues Resolved](#) on page 23 and [Software Patches Included in this Release](#) on page 24 to see if this version contains fixes for or otherwise resolves any of your customer service (Intel Premier Support) requests.

## 1.2. Changes to Software Behavior

This section documents instances in which the behavior and default settings of the Intel Quartus Prime Pro Edition software have been changed from earlier releases of the Intel Quartus Prime Pro Edition software.

Intel Quartus Prime Pro Edition has the following changes:

- The Intel Quartus Prime software now generates compressed SOF files by default. Previously, generated SOF files were uncompressed.
- The **Transceivers** page of the Power and Thermal Calculator has the following changes:
  - Option names in the **Treatment of unused transceivers** field have changed:
    - **Power Down Unused Dies** is now **Power Down Unused Transceivers**
    - **Power Up Unused Dies** is now **Power Up Unused Transceivers**
    - **Preserve Unused Channels on Used and Unused Dies** is now **Preserve Unused Channels on Used and Unused Transceivers**
  - Some column names in the table have changed:
    - **Tile** is now **Transceiver Type**
    - **XCVR Die ID** is now **Transceiver ID**
    - **Treatment of unused transceiver dies** is now **Treatment of unused transceivers**
  - Tooltips have changed as follows:
    - References to *tiles* or *dies* are replaced with *transceivers*
    - References to *GTS transceivers* are added where needed

Refer to the Intel Quartus Prime Default Settings File (.qdf), *<Quartus Prime installation directory>/quartus/bin/assignment\_defaults.qdf*, for a list of all the default assignment settings for the latest version of the Intel Quartus Prime software.

### 1.2.1. Deprecated Features and Functions

The functions and features listed in this section have been deprecated but not removed from Intel Quartus Prime Pro Edition Version 23.2 or earlier. Migrate your tools and processes to use the replacement or alternate features and functions before the deprecated features and functions are removed.

#### Features and Functions Deprecated as of Intel Quartus Prime Pro Edition Version 23.2

The Nios® II Processor and Nios II Embedded Design Suite products are deprecated and will be removed in a future release. For details, refer to Product Discontinuation Notice [PDN2312](#).

#### Features and Functions Deprecated as of Intel Quartus Prime Pro Edition Version 23.1

No Intel Quartus Prime features or functions have been deprecated in Intel Quartus Prime Pro Edition Version 23.1.

#### Features and Functions Deprecated as of Intel Quartus Prime Pro Edition Version 22.4

No Intel Quartus Prime features or functions have been deprecated in Intel Quartus Prime Pro Edition Version 22.4.

#### Features and Functions Deprecated as of Intel Quartus Prime Pro Edition Version 22.3

The Intel FPGA SDK for OpenCL™ software product is deprecated.

Intel is discontinuing the Intel FPGA SDK for OpenCL software product. Refer to the Product Discontinuation Notice [PDN2219](#).

As an alternative, use the Intel oneAPI Base Toolkit, which provides core tools and libraries for developing high-performance, data-centric applications across diverse architectures. It features an industry-leading C++ compiler that implements SYCL\*, an evolution of C++ for heterogeneous computing. For more information, refer to the [Intel oneAPI Base Toolkit](#) web page.

To migrate your OpenCL FPGA designs to SYCL\*, review [Migrating OpenCL FPGA Designs to SYCL\\*](#) guide that demonstrates important differences between OpenCL and SYCL for FPGA and provides steps to migrate your OpenCL designs.

## 1.2.2. Removed Features and Functions

The functions and features listed in this section have been removed from Intel Quartus Prime Pro Edition Version 23.2 or earlier.

### Features and Functions Removed from Intel Quartus Prime Pro Edition Version 23.2

No Intel Quartus Prime features or functions have been removed from Intel Quartus Prime Pro Edition Version 23.2.

### Features and Functions Removed from Intel Quartus Prime Pro Edition Version 23.1

No Intel Quartus Prime features or functions have been removed from Intel Quartus Prime Pro Edition Version 23.1.

### Features and Functions Removed from Intel Quartus Prime Pro Edition Version 22.4

No Intel Quartus Prime features or functions have been removed from Intel Quartus Prime Pro Edition Version 22.4.

### Features and Functions Removed from Intel Quartus Prime Pro Edition Version 22.3

No Intel Quartus Prime features or functions have been removed from Intel Quartus Prime Pro Edition Version 22.3.

### 1.3. Intel FPGA IP Regeneration

The following Intel FPGA IPs have major version updates and must be regenerated in Intel Quartus Prime Pro Edition Version 23.2:

- External Memory Interfaces (EMIF) IP
- F-Tile 25G Ethernet Intel FPGA Soft-IP
- F-Tile Auto-Negotiation and Link Training for Ethernet Intel FPGA IP
- F-Tile Avalon Streaming Intel FPGA IP for PCI Express
- F-Tile Ethernet Intel FPGA Hard IP
- F-Tile Ethernet Multirate Intel FPGA IP
- F-Tile Interlaken Intel FPGA IP
- F-Tile Low Latency 50G Ethernet Intel FPGA Soft-IP
- F-Tile Multichannel DMA Intel FPGA IP for PCI Express
- F-Tile Serial Lite IV Intel FPGA IP
- MACsec Intel FPGA IP
- PCIe DMA Controller 64
- PCIe DMA Controller Intel Stratix 10 FPGA IP
- PHY Lite for Parallel Interfaces Intel FPGA IP
- P-Tile Multichannel DMA Intel FPGA IP for PCI Express
- R-Tile Avalon Streaming Intel FPGA IP for PCI Express
- R-Tile Multichannel DMA Intel FPGA IP for PCI Express
- Triple-Speed Ethernet Intel FPGA IP



## 1.4. Operating System Support

Information about operating system support for the Intel Quartus Prime Design Suite is available on the Operating System Support page of the Intel FPGA website.

### Microsoft\* Windows\* Requirements

For some Microsoft\* Windows\* operating systems, Intel Quartus Prime Design Suite requires a specific level of operating system or other settings as follows:

**Table 1. Microsoft Windows Requirements**

Operating System	Required Version Level or Other Requirements
Windows 10	Windows 10 Version 1809 (build 17763) or later
Windows 11	Windows 11 Version 22H2 (build 22621) or later
Windows Server* 2019	N/A

### Operating System Support Changes in Intel Quartus Prime Pro Edition Version 23.2

There are no operating system support changes in Intel Quartus Prime Pro Edition Version 23.2.

### Operating System Support Changes in Intel Quartus Prime Pro Edition Version 23.1

Support for the following operating systems is added as of Intel Quartus Prime Pro Edition Version 23.1:

- Red Hat\* Enterprise Linux\* 8.7

Support for the following operating systems is removed as of Intel Quartus Prime Pro Edition Version 23.1:

- Windows 10 Version 1607 or earlier  
Use Windows 10 Version 1809 (build 17763) or later
- Windows 11 Version 21H2 or earlier  
Use Windows Version 22H2 (build 22621) or later
- Windows Server\* 2016

### Operating System Support Changes in Intel Quartus Prime Pro Edition Version 22.4

There are no operating system support changes in Intel Quartus Prime Pro Edition Version 22.4.

### Operating System Support Changes in Intel Quartus Prime Pro Edition Version 22.3

Support for the following operating systems is added as of Intel Quartus Prime Pro Edition Version 22.3:

- Red Hat Enterprise Linux 8.4
- Red Hat Enterprise Linux 8.6
- Ubuntu\* Linux 22.04 LTS
- Windows 11

Support for the following operating systems is deprecated as of Intel Quartus Prime Pro Edition Version 22.3:

- Windows Server 2016
- Windows 10 Version 1607

Later version of Windows 10 remain supported. Migrate your Windows 10 installation to Windows 10 Version 1809 or later.

Support for these operating systems might be removed in a future release.

Support for the following operating systems is removed as of Intel Quartus Prime Pro Edition Version 22.3:

- CentOS\* Linux 8.2
- Red Hat Enterprise Linux 8.2

### Related Information

[Operating System Support](#)

## 1.5. Disk Space and Memory Recommendations

A full installation of the Intel Quartus Prime Pro Edition software requires up to 140 GB of available disk space.

Configure your system to provide additional virtual memory equal to the recommended physical RAM that is required to process your design. This additional virtual memory effectively doubles the total effective memory available to process your design.

**Note:** Peak virtual memory might exceed these recommendations. These recommendations are based on the amount of physical memory required to achieve runtime within 10% of that achieved on hardware with an infinite amount of RAM.

**Table 2. Memory Requirements for Processing Intel Agilex 7 F-Series Designs**

These requirements are the same for both Windows and Linux installations.

Family	Device	Recommended Physical RAM
Intel Agilex 7 F-Series	AGFA022, AGFA023, AGFA027 AGFB022, AGFB023, AGFB027 AGFC023 AGFD023	64 GB
	AGFA019, AGFB019, AGFC019, AGFD019	48 GB
	AGFA006, AGFA008, AGFA012, AGFA014 AGFB006, AGFB008, AGFB012, AGFB014	32 GB

**Table 3. Memory Requirements for Processing Intel Agilex 7 I-Series Designs**

These requirements are the same for both Windows and Linux installations.

Family	Device	Recommended Physical RAM
Intel Agilex 7 I-Series	AGIA023, AGIA035, AIGA040 AGIB022, AGIB023, AGIB027, AGIB041 AGIC023, AGIC035, AGIC040, AGIC041 AGID023, AGID041	64 GB
	AGIB019, AGID019	48 GB

**Table 4. Memory Requirements for Processing Intel Agilex 7 M-Series Designs**

These requirements are the same for both Windows and Linux installations.

Family	Device	Recommended Physical RAM
Intel Agilex 7 M-Series	AGME032, AGME039 AGMF032, AGMF039 AGMG032, AGMG039 AGMH032, AGMH039	64 GB

**Table 5. Memory Requirements for Processing Intel Arria® 10 Designs**

These requirements are the same for both Windows and Linux installations.

Family	Device	Recommended Physical RAM
Intel Arria® 10	10AT115, 10AX115	48 GB
	10AT090, 10AX090	44 GB
	10AS066, 10AX066	32 GB
	10AS057, 10AX057	30 GB
	10AS048, 10AX048	28 GB
	10AS032, 10AX032	24 GB
	10AS027, 10AX027	22 GB
	10AS022, 10AX022	20 GB
	10AS016, 10AX016	18 GB

**Table 6. Memory Requirements for Processing Intel Cyclone® 10 GX Designs**

These requirements are the same for both Windows and Linux installations.

Family	Device	Recommended Physical RAM
Intel Cyclone® 10 GX	10CX85, 10CX105, 10CX150, 10CX220	18 GB

**Table 7. Memory Requirements for Processing Intel Stratix® 10 Designs**

These requirements are the same for both Windows and Linux installations.

Family	Device	Recommended Physical RAM
Intel Stratix® 10	1SD21BP, 1SD280P, 1SG10MH, 1SG210H, 1SG211H, 1SG250H, 1SG250L, 1SG280H, 1SG280L, 1SM21BE, 1SM21BH, 1SM21CH, 1ST210E, 1ST250E, 1ST280E, 1SX210H, 1SX250H, 1SX250L, 1SX280H, 1SX280L	64 GB
	1SG165H, 1SG166H, 1SM16BE, 1SM16BH, 1SM16CH, 1ST165E, 1SX165H	48 GB
	1SD110P, 1SG040H, 1SG065H, 1SG085H, 1SG110H, 1ST040E, 1ST085E, 1ST110E, 1SX065H, 1SX085H, 1SX110H, 1SX040H	32 GB

## 1.6. Intel Quartus Prime Licensing Information

If you use a floating license with Intel Quartus Prime Version 23.2, ensure that you use the most recent version of the FlexLM license daemon.

For more information about Intel Quartus Prime licensing, refer to [Intel FPGA Software Installation and Licensing](#).

### Related Information

- [Intel FPGA Software Installation and Licensing](#)
- [FlexLM License Daemons for Intel FPGA Software](#)

## 1.7. Device Support and Pin-Out Status

Device support and pin-out status is divided into the following categories:

- [Final device support](#)
- [Preliminary device support](#)
- [Advance device support](#)

For changes in device support levels from the previous Intel Quartus Prime release, refer to [Changes in Device Support](#) on page 16.

For information about known device issues and workarounds, refer to the [Intel FPGA Knowledge Base](#).

### Final Device Support

For devices with **Final** device support, Intel Quartus Prime provides compilation, simulation, timing analysis, and programming support (including pin-out information).

The device models, bitstreams, and firmware for the devices are finalized.

**Table 8. Final Device Support**

Final compilation, simulation, timing analysis, and programming support are available for the devices listed in this table. These devices have finalized device models, bitstream, and firmware.

Device Family	Devices
Intel Agilex 7 F-Series	AGFA012R24B, AGFA014R24B, AGFB012R24B, AGFB014R24B AGFA019R25A, AGFA023R25A, AGFB019R25A, AGFB023R25A, AGFC019R25A, AGFC023R25A, AGFD019R25A, AGFD023R25A AGFA022R25A, AGFA027R25A, AGFB022R25A, AGFB027R25A
Intel Arria 10	10AS016, 10AS022, 10AS027, 10AS032, 10AS048, 10AS057, 10AS066 10AT090, 10AT115 10AX016, 10AX022, 10AX027, 10AX032, 10AX048, 10AX057, 10AX066, 10AX090, 10AX115
Intel Cyclone 10 GX	10CX085, 10CX105, 10CX150, 10CX220
Intel Stratix 10	1SD110P, 1SD21BP, 1SD280P 1SG040H, 1SG065H, 1SG085H, 1SG10MH, 1SG110H, 1SG165H, 1SG166H, 1SG210H, 1SG211H, 1SG250H, 1SG250L, 1SG280H, 1SG280L 1SM16BE, 1SM16BH, 1SM16CH, 1SM21BE, 1SM21BH, 1SM21CH, 1ST040E, 1ST085E, 1ST110E, 1ST165E, 1ST210E, 1ST250E, 1ST280E 1SX040H, 1SX065H, 1SX085H, 1SX110H, 1SX165H, 1SX210H, 1SX250H, 1SX250L, 1SX280H, 1SX280L

### Preliminary Device Support

For devices with **Preliminary** device support, Intel Quartus Prime provides compilation, simulation, timing analysis, and programming support (including pin-out information).

However, the device models, bitstreams, and firmware for the devices are not finalized.

**Table 9. Preliminary Device Support**

Full compilation, simulation, timing analysis, and programming support are available for the devices listed in this table.

Device Family	Devices
Intel Agilex 7 F-Series	AGFA006R16A, AGFA008R16A, AGFB006R16A, AGFB008R16A, AGFA006R24C, AGFA008R24C, AGFB006R24C, AGFB008R24C AGFA014R24A-R0, AGFB014R24A-R0 AGFA012R24A, AGFA014R24A, AGFB012R24A, AGFB014R24A AGFA012R24C-AA, AGFA014R24C-AA, AGFA012R24C, AGFA014R24C, AGFB012R24C, AGFB014R24C, AGFB012R24C-AA, AGFB014R24C-AA AGFA023R25A-R0, AGFB023R25A-R0, AGFC023R25A-R0, AGFD023R25A-R0 AGFA019R31C, AGFA023R31C, AGFB019R31C, AGFB023R31C, AGFC019R31C, AGFC023R31C, AGFD019R31C, AGFD023R31C AGFA022R24C, AGFA027R24C, AGFA027R24C-R0, AGFA027R24C-R2, AGFB022R24C, AGFB027R24C, AGFB027R24C-R0, AGFB027R24C-R2 AGFA022R31C, AGFA022R31C-AA, AGFA027R31C, AGFA027R31C-AA, AGFA027R31C-R0, AGFB022R31C, AGFB022R31C-AA, AGFB027R31C, AGFB027R31C-AA, AGFB027R31C-R0, AGFA027R25A-R0, AGFB027R25A-R0
Intel Agilex 7 I-Series	AGIB041R29D-R0, AGIB041R29D-R1, AGIC041R29D-R0, AGIC041R29D-R1, AGID041R29D-R0, AGID041R29D-R1 AGIB019R18A, AGIB023R18A, AGID019R18A, AGID023R18A, AGIA023R18A-R0, AGIB023R18A-R0, AGIC023R18A-R0, AGID023R18A-R0 AGIB019R31B, AGIB023R31B, AGID019R31B, AGID023R31B AGIB027R29A-R0, AGIB027R29A-R1, AGIB027R29A-R2, AGIB027R29A-R3 AGIB022R31B, AGIB022R31B-AA, AGIB027R31B, AGIB027R31B-AA, AGIB027R31B-R0, AGIA040R39A-R0, AGIC040R39A-R0
Intel Stratix 10	1SD110P-S1 1SG280H-S3, 1SG280L-S3 1SX280H-S3, 1SX280L-S3

### Advance Device Support

For devices with **Advance** device support, Intel Quartus Prime provides compilation, simulation, and timing analysis support but the device models, bitstreams, and firmware for the devices are not finalized.

Pin-out information is generated for devices with **Advance** devices support, but programming files are not generated.

**Table 10. Advance Device Support**

Compilation, simulation, and timing analysis support are provided for these devices. The compiler generates pin-out information for these devices in this release, but does not generate programming files.

Device Family	Devices
Intel Agilex 7 F-Series	AGFA019R24C, AGFA023R24C, AGFB019R24C, AGFB023R24C, AGFC019R24C, AGFC023R24C, AGFD019R24C, AGFD023R24C
Intel Agilex 7 I-Series	AGIB041R29D, AGIC041R29D, AGID041R29D AGIB041R31B, AGIB041R31B-R0, AGIC041R31B, AGID041R31B AGIB022R31A, AGIB027R31A AGIB022R29A, AGIB027R29A, AGIB027R29B AGIA035R39A, AGIA040R39A, AGIC035R39A, AGIC040R39A
Intel Agilex 7 M-Series	AGMF032R47A-V, AGMF039R47A, AGMH032R47A, AGMH039R47A, AGME032R47A-V, AGME039R47A, AGMG032R47A, AGMG039R47A

## 1.7.1. Changes in Device Support

### New Device Support

Support for the following devices is added to Intel Quartus Prime Pro Edition Version 23.2 with **Advance** device support:

- AGIB041R29D, AGIC041R29D, AGID041R29D
- AGIB041R31B, AGIB041R31B-R0, AGIC041R31B, AGID041R31B
- AGMF032R47A-V, AGMF039R47A, AGMH032R47A, AGMH039R47A
- AGME032R47A-V, AGME039R47A, AGMG032R47A, AGMG039R47A

### Changed Device Support

Support for the following devices moves from **Advance** device support to **Preliminary** device support:

- AGIB041R29D-R0
- AGIB041R29D-R1
- AGIC041R29D-R0
- AGIC041R29D-R1
- AGID041R29D-R0
- AGID041R29D-R1

### F-Tile Support Changes

For Intel Agilex 7 designs with F-Tile IPs that were developed with Intel Quartus Prime Pro Edition Version 22.1 or earlier, you must regenerate your F-Tile IP in Intel Quartus Prime Pro Edition Version 22.2 or later.

The following devices are affected:

- AGFA006R16A, AGFA008R16A, AGFA022R24C, AGFA022R31C, AGFA027R24C, AGFA027R31C
- AGFB006R16A, AGFB008R16A, AGFB022R24C, AGFB022R31C, AGFB027R24C, AGFB027R31C
- AGIB022R29A, AGIB022R31B, AGIB027R29A, AGIB027R31B



## 1.8. Timing Model, Power Model, and Device Status

Only devices with a timing model, power model, and device status of **Final** are suitable for production systems.

**Table 11. Timing Model, Power Model, and Device Status for Intel Agilex 7 F-Series Devices**

Device Family	Device	Timing Model Status	Power Model Status	Device Status
Intel Agilex 7 F-Series	AGFC023R25A-AE, AGFD023R25A-AE	Final – 22.3	Final – 22.3	Final – 22.3
	AGFA019R25A, AGFA023R25A AGFB019R25A, AGFB023R25A AGFC019R25A, AGFC023R25A AGFD019R25A, AGFD023R25A	Final – 22.2	Final – 22.2	Final – 22.2
	AGFA012R24B, AGFA014R24B, AGFA022R25A, AGFA027R25A AGFB012R24B, AGFB014R24B, AGFB022R25A, AGFB027R25A	Final – 21.3	Final – 21.3	Final – 21.3
	AGFA012R24A, AGFA014R24A, AGFB012R24A, AGFB014R24A	Final	Final	Preliminary
	AGFA006R16A, AGFA006R24C, AGFA008R16A, AGFA008R24C, AGFA012R24C, AGFA012R24C-AA, AGFA014R24C, AGFA014R24C-AA AGFA019R24C, AGFA019R31C, AGFA022R24C, AGFA022R31C, AGFA022R31C-AA, AGFA023R24C, AGFA023R31C, AGFA027R24C, AGFA027R31C, AGFA027R31C-AA AGFB006R16A, AGFB006R24C, AGFB008R16A, AGFB008R24C, AGFB012R24C, AGFB012R24C-AA, AGFB014R24C, AGFB014R24C-AA, AGFB019R24C, AGFB019R31C, AGFB022R24C, AGFB022R31C, AGFB022R31C-AA, AGFB023R24C, AGFB023R31C, AGFB027R24C, AGFB027R31C, AGFB027R31C-AA AGFC019R24C, AGFC019R31C, AGFC023R24C, AGFC023R31C AGFD019R24C, AGFD019R31C, AGFD023R24C, AGFD023R31C	Preliminary	Preliminary	Preliminary
	AGFA014R24A-R0, AGFA023R25A-R0, AGFA027R24C-R0, AGFA027R24C-R2, AGFA027R25A-R0, AGFA027R31C-R0 AGFB014R24A-R0, AGFB023R25A-R0, AGFB027R24C-R0, AGFB027R24C-R2, AGFB027R25A-R0, AGFA027R31C-R0 AFGC023R25A-R0 AFGD023R25A-R0	Preliminary	Preliminary	Preliminary

**Table 12. Timing Model, Power Model, and Device Status for Intel Agilex 7 I-Series Devices**

Device Family	Device	Timing Model Status	Power Model Status	Device Status
Intel Agilex 7 I-Series	AGIA035R39A, AGIA040R39A AGIB019R18A, AGIB019R31B, AGIB022R29A, AGIB022R31A, AGIB022R31B, AGIB022R31B-AA, AGIB023R18A, AGIB023R31B, AGIB027R29A, AGIB027R29B, AGIB027R31A, AGIB027R31B, AGIB027R31B-AA, AGIB041R29D, AGIB041R31B AGIC035R29A, AGIC040R39A, AGIC041R29D, AGIC041R29D, AGIC041R31B AGID019R18A, AGID019R31B, AGID023R18A, AGID023R31B, AGID041R29D, AGID041R31B	Preliminary	Preliminary	Preliminary
	AGIA023R18A-R0, AGIA040R39A-R0 AGIB023R18A-R0, AGIB027R29A-R0, AGIB027R29A-R1, AGIB027R29A-R2, AGIB027R29A-R3, AGIB027R31B-R0, AGIB041R29D-R0, AGIB041R29D-R1, AGIB041R31B-R0 AGIC023R18A-R0, AGIC040R39A-R0, AGIC041R29D-R0, AGIC041R29D-R1 AGID023R18A-R0, AGID041R29D-R0, AGID041R29-R1	Preliminary	Preliminary	Preliminary

**Table 13. Timing Model, Power Model, and Device Status for Intel Agilex 7 M-Series Devices**

Device Family	Device	Timing Model Status	Power Model Status	Device Status
Intel Agilex 7 M-Series	AGMF032R47A-V, AGMF039R47A, AGMH032R47A, AGMH039R47A AGME032R47A-V, AGME039R47A, AGMG032R47A, AGMG039R47A	Preliminary	Preliminary	Preliminary

**Table 14. Timing Model, Power Model, and Device Status for Intel Arria 10 Devices**

Device Family	Device	Timing Model Status	Power Model Status	Device Status
Intel Arria 10	10AX016, 10AS016, 10AX022, 10AS022, 10AX027, 10AS027, 10AX032, 10AS032	Final – 16.1 <sup>(1)</sup> (2)	Final – 17.0	Final – 17.0
	10AX048, 10AS048	Final – 16.0.2 <sup>(2)</sup>	Final – 17.0	Final – 17.0
	10AX057, 10AS057, 10AX066, 10AS066, 10AT090, 10AX090	Final – 16.0.1 <sup>(2)</sup>	Final – 16.0.1	Final – 16.0.1
	10AX115, 10AT115	Final – 16.0 <sup>(2)</sup>	Final – 16.0	Final – 16.0

<sup>(1)</sup> Devices with a -1 speed grade were finalized in Intel Quartus Prime software version 17.0

<sup>(2)</sup> All military grade devices were finalized in Intel Quartus Prime software version 18.0.1.

**Table 15. Timing Model, Power Model, and Device Status for Intel Cyclone 10 Devices**

Device Family	Device	Timing Model Status	Power Model Status	Device Status
Intel Cyclone 10 GX	10CX085, 10CX105, 10CX150, 10CX220	Final – 17.0	Final – 18.0	Final – 18.0

**Table 16. Timing Model, Power Model, and Device Status for Intel Stratix 10 Devices**

Device Family	Device	Timing Model Status	Power Model Status	Device Status
Intel Stratix 10	1SG280L, 1SX280L, 1SG250L, 1SX250L	Final – 18.0.1	Final – 18.1.1	Final – 18.1.1
	1SG280H, 1SX280H, 1SG250H, 1SX250H, 1SG210H, 1SX210H, 1SG165H, 1SX165H, 1SG110H, 1SX110H, 1SG085H, 1SX085H	Final – 18.1.1	Final – 18.1.1	Final – 18.1.1
	1ST280E, 1ST250E	Final – 18.1.1	Final – 19.4	Final – 19.4
	1SM21BH, 1SM21CH, 1SM16BH, 1SM16CH	Final – 19.1	Final – 19.1	Final – 19.1
	1SG10MH, 1SG166H, 1SG211H	Final – 19.1	Final – 19.3	Final – 19.3
	1ST210E, 1SM21BE, 1ST165E, 1SM16BE	Final – 19.2	Final – 19.4	Final – 19.4
	1SD280P, 1ST040E, 1ST085E, 1ST110E	Final – 20.1	Final – 20.1	Final – 20.1
	1SD110P	Final – 20.2	Final – 20.2	Final – 20.2
	1SD21BP	Final – 20.3	Final – 20.3	Final – 20.3
	1SG040H, 1SX040H	Final – 20.3	Final – 20.3	Final – 21.1
	1SG065H, 1SX065H	Final – 21.2	Final – 21.2	Final – 21.2

### Related Information

*System Design with Advance FPGA Timing Models*

## 1.9. IBIS Models

**Table 17. IBIS Model Status for the Intel Quartus Prime Pro Edition Software Release Version 23.2**

Device Family	IBIS Model Status
Intel Agilex 7	Refer to <a href="#">IBIS Models for Intel Devices</a> .
Intel Arria 10	
Intel Cyclone 10 GX	
Intel Stratix 10	

Starting with the Intel Agilex 7 device family, IBIS models are available only online at the following web page: [IBIS Models for Intel FPGA Devices](#). This page is updated as IBIS models for devices become available or are updated.

## 1.10. EDA Interface Information

**Table 18. Synthesis Tools Supporting the Intel Quartus Prime Pro Edition Software Release Version 23.2**

Synthesis Tools	Version
Siemens* EDA Precision* FPGA Synthesis	Siemens EDA Precision FPGA Synthesis versions that support the Intel Quartus Prime software are typically released after the release of the Intel Quartus Prime software. Contact Siemens EDA for versions of Siemens EDA Precision FPGA Synthesis that support Intel Quartus Prime Pro Edition Software Version 23.2.
Synopsys* Synplify*, Synplify Pro*, and Synplify Premier	Synopsys Synplify, Synplify Pro, and Synplify Premier versions that support the Intel Quartus Prime software are typically released after the release of the Intel Quartus Prime software. Contact Synopsys for versions of Synopsys Synplify, Synplify Pro, and Synplify Premier that support Intel Quartus Prime Pro Edition Software Version 23.2.

**Table 19. Simulation Tools Supporting the Intel Quartus Prime Pro Edition Software Release Version 23.2**

The following simulation tools support RTL and functional gate-level simulation. Only 64-bit simulation tools are supported.

Simulation Tools	Version
Aldec* Active-HDL*	13.0 (Windows only)
Aldec Riviera-PRO*	2023.04
Cadence* Xcelium* Parallel Logic Simulation	22.09.001 (Linux* only)
Questa*-Intel FPGA Edition	2023.1
Siemens EDA ModelSim SE	2022.4
Siemens EDA Questa Advanced Simulator	2022.4
Synopsys VCS* and VCS MX	T-2022.06-SP2-3 (Linux only)

Questa-Intel FPGA Edition requires FlexLM licensing daemon version 11.16.4.0 (or later). You can obtain the licensing daemon from the [FlexLM License Daemons for Intel FPGA Software](#) web page.

You can obtain the Intel FPGA Edition of simulation tools from the Download Center for FPGAs.

### Operating System Support for Questa-Intel FPGA Edition Version 2022.2

- Red Hat Enterprise Linux 8
- SUSE\* Linux Enterprise Server 12
- SUSE Linux Enterprise Server 15
- Windows 10 (64-bit)

### Related Information

- [Intel Quartus Prime Pro Edition Design Software for Linux](#)
- [Intel Quartus Prime Pro Edition Design Software for Windows](#)

## 1.11. Antivirus Verification

The Intel Quartus Prime software has been verified virus free with the following software:

### Antivirus Verification Software for Intel Quartus Prime Pro Edition Version 23.2

McAfee VirusScan Command Line for Linux64 Version: 7.0.0.477  
AV Engine version: 6300.9389 for Linux64.  
Dat set version: 10745 created Jun 18 2023

## 1.12. Software Issues Resolved

The following customer service requests were fixed or otherwise resolved in Intel Quartus Prime Pro Edition Version 23.2:

**Table 20. Issues Resolved in the Intel Quartus Prime Pro Edition Version 23.2**

Intel Premier Support Case Numbers							
00617214	00636463	00661260	00673194	00679703	00681187	00714476	00726697
00746401	00756227	00756293	00758954	00772970	00778101	00778430	00778779
00778813	00780944	00782644	00783007	00783013	00784065	00785139	00786113
00786506	00786753	00786823	00787012	00787370	00787508	00787712	00787955
00788054	00788055	00788417	00789157	00789190	00791021	00791037	00791068
00794129	00795994	00798333	00799499	00801298	00801701	00802096	00803467
05705512							

## 1.13. Software Patches Included in this Release

Intel Quartus Prime Pro Edition Version 23.2 contains the following patches for previous versions of Intel Quartus Prime Pro Edition software:

**Table 21. Software Patches included in Intel Quartus Prime Pro Edition Version 23.2**

Software Version	Patch	Intel Premier Support Case Number
Intel Quartus Prime Version 23.1	0.19	00790512
Intel Quartus Prime Version 23.1	0.18	–
Intel Quartus Prime Version 23.1	0.17	00786506
Intel Quartus Prime Version 23.1	0.12	–
Intel Quartus Prime Version 23.1	0.11fw	–
Intel Quartus Prime Version 23.1	0.05fw	00786823
Intel Quartus Prime Version 23.1	0.04	00783007
Intel Quartus Prime Version 22.4	0.33	00786506
Intel Quartus Prime Version 22.4	0.29	00786113
Intel Quartus Prime Version 22.4	0.27	–
Intel Quartus Prime Version 22.4	0.23	00785139
Intel Quartus Prime Version 22.4	0.21fw	–
Intel Quartus Prime Version 22.3	0.46fw	–
Intel Quartus Prime Version 22.3	0.43	–
Intel Quartus Prime Version 22.3	0.42	–
Intel Quartus Prime Version 22.2	0.51	–
Intel Quartus Prime Version 22.2	0.50fw	–
Intel Quartus Prime Version 21.4	0.89	–
Intel Quartus Prime Version 21.3	0.56	–
Intel Quartus Prime Version 21.2	0.53	00786113



## 1.14. Latest Known Intel Quartus Prime Software Issues

Information about known issues that affect Intel Quartus Prime Pro Edition Version 23.2 is available in the Intel FPGA Knowledge Base.

For the latest information about issues that affect Intel Quartus Prime Pro Edition Version 23.2, review [the Intel FPGA Knowledge Base articles that apply to Intel Quartus Prime Pro Edition Version 23.2](#).

You can find known issue information for previous versions of the Quartus Prime software on the [Intel FPGA Knowledge Base](#) web page.

Information about known software issues that affect previous versions of the Quartus II software is available on the [Intel Quartus Prime and Quartus II Software Support](#) web page.

Information about issues affecting the Intel FPGA IP Library is available in the release notes for each IP. You can find the IP release notes on the [Intel FPGA Documentation Index](#) web page.

### Related Information

- [Intel FPGA Knowledge Base](#)
- [Intel Quartus Prime and Quartus II Software Support](#)
- [Intel FPGAs and Programmable Devices Release Notes](#)



## 1.15. Intel Quartus Prime Pro Edition Software and Device Support Release Notes Archives

For the latest and previous versions of these release notes, refer to [Intel Quartus Prime Pro Edition Software and Device Support Release Notes](#). If a software version is not listed, the release notes for the previous software version applies.



## 1.16. Intel Quartus Prime Pro Edition Software Release Version 23.2 Document Revision History

Document Version	Intel Quartus Prime Version	Changes
2023.06.26	23.2	<ul style="list-style-type: none"><li>Initial release.</li></ul>