Intel® Quartus® Prime Pro Edition

Version 22.3 Software and Device Support Release Notes

Updated for Intel® Quartus® Prime Design Suite: **22.3**

Online Version
Send Feedback

RN-01082-22.3.0

ID: 683706
Version: 2022.11.21

Contents

1. Intel® Quartus® Prime Pro Edition Version 22.3 Software and Device Support Release Notes

This document provides late-breaking information about Intel® Quartus® Prime Pro Edition Version 22.3.

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 22.3 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.

New Intel Quartus Prime Device Support and Device Support Enhancements

- Added support for new Intel Agilex™ devices. For details, refer to Changes in Device Support on page 11.

New Intel Quartus Prime GUI Features and Enhancements

- Enhanced the Logic Lock Regions window of the Chip Planner with a **Compilation Regions** tab. This read-only tab displays the properties of any Logic Lock regions contained in a `.qdb` file in the current project.
- Enhanced the RTL Analyzer with the following new interfaces:
  - **Connectivity Tracer**, which enables tracing fan-out and fan-in cones from or to an instance port (bus) or a top-level port.
  - **Object Set Console**, which displays all currently selected, highlighted, or colored nodes in the schematic viewer.

New Compiler Features and Enhancements

- Increased the maximum number of processors cores that the Compiler can use to 24 cores.
- Added support for `force` statements in HDL code.
- Added support for cross-module referencing (XMR) in HDL code.

New Programmer Features and Enhancements

- Added the ability to create a file system partition in the flash memory.

New Configuration Debugger Features and Enhancements

- Added ability to monitor voltage of the available external channels and internal power supplies of SDM-based devices.
- Added ability to monitor temperature of the core fabric, HSSI channels, and UIB blocks of SDM-based devices.
- Added ability to parse programming files (`.sof`, `.pmsf`, `.rbf`, `.jic`, `.rpd`, and `.pof`)
- Added ability to send generic SDM mailbox commands using the generic command line interface.

New Synthesis Features and Enhancements

- Enhanced the **Registers Removed During Synthesis** report to be a dynamic report. With dynamic reports, you can interact with a report that appears to be cut off in the GUI due to display limits. Report items for dynamic reports are stored in an SQLite database that you can access through Tcl commands.
- Added a new **Additional Pragma Usages** report to report Verific-only pragmas such as `translate_on` and `translate_off`.

New Timing Analyzer Features and Enhancements

- (Beta) Enhanced the Design Netlist Infrastructure (DNI) support with the following features:
  - Enabled post-synthesis static timing analysis (STA). This stage is called **Early Timing Analysis** in the compilation dashboard. Early Timing Analysis provides you with a faster turnaround on designs and early constraint checking,
  - Enabled Synopsys* design constraint on RTL targets (SDC-on-RTL).

    Use this feature to apply SDCs on an RTL netlist instead of the timing names generated by the Intel Quartus Prime software. You can apply the constraints on hierarchical names as well as primitives. This feature provides a convenient way to specify SDCs.
- Enhanced the **Report Register Statistics** report (formerly **Report Reset Statistics** report) to highlight places with Hyper-Registers, reset control signals, and enable control signals. Use this information, along with timing slack, congestion, and other analysis reports, to sanity check register control signals, identify timing critical parts of your design where you can remove resets, or change control schemes to more easily meet timing requirements.

New Advanced Link Analyzer Features and Enhancements

- Updated Intel Agilex F-tile transceiver supports.
- Added custom forward clocking modeling and simulation supports.
- Updated COM/ERL support for 106G Ethernet and 112G CEI standards.

New Power and Thermal Calculator Features and Enhancements

- Added support for RTL hierarchies. You can enter hierarchy information and report power data for each level of your design hierarchy.

Bug Fixes

Intel Quartus Prime Pro Edition Software Version 22.3 also include bug fixes. Review Software Issues Resolved on page 16 and Software Patches Included in this Release on page 17 to see if this version contains fixes for or otherwise resolves any of your customer service 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.

- In Timing Analyzer, the **Report Reset Statistics** report is renamed to **Report Register Statistics**.

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 22.3 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 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.

Features and Functions Deprecated as of Intel Quartus Prime Pro Edition Version 22.2

No features or functions have been deprecated in Intel Quartus Prime Pro Edition Version 22.2.

Features and Functions Deprecated as of Intel Quartus Prime Pro Edition Version 22.1

No features or functions have been deprecated in Intel Quartus Prime Pro Edition Version 22.1.

Features and Functions Deprecated as of Intel Quartus Prime Pro Edition Version 21.4

As of Intel Quartus Prime Pro Edition Version 21.4, support for Intel Enpirion® devices is deprecated. Support for these devices might be removed in a future release.

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 22.3 or earlier.

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

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

Features and Functions Removed from Intel Quartus Prime Pro Edition Version 22.2

No features or functions have been removed from Intel Quartus Prime Pro Edition Version 22.2.

Features and Functions Removed from Intel Quartus Prime Pro Edition Version 22.1

- Removed support for the following operating systems:
  - CentOS* 7.5
  - Red Hat* Enterprise Linux* 7
  - Windows Server* 2012
- Removed support for Siemens* EDA ModelSim* SE.

  Use Siemens EDA Questa* Advanced Simulator instead.

Features and Functions Removed from Intel Quartus Prime Pro Edition Version 21.4

- Removed simple quad-port (SQP) memory mode support for the following devices:
  - All Intel Stratix® 10 Smart VID industrial grade OPNs (-I1V, -I2V, and –I3V)
  - All Intel Stratix 10 fixed voltage OPNs (-E2L, -E3X, -I2L, -I3X, and –C2L)

  If you have designs that use SQP mode and target any of these devices, you now receive an error message during synthesis that indicates SQP mode is no longer supported.

  For more details about this removal, refer to "*Why are there functional errors in my simple quad port mode M20K RAM?*" in the Intel FPGA Knowledge Base.

1.3. 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* Update Version Requirements

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

Table 1. Supported Microsoft Windows Update Versions

Operating System	Required Updates or Version Level
Windows 10	Windows 10 Version 1607 or later. Windows 10 Version 1809 or later is recommended.
Windows Server* 2016	N/A
Windows Server 2019	N/A

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

Support for the following operating systems is deprecated in 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.

Operating System Support Changes in Intel Quartus Prime Pro Edition Version 22.2

There are no operating system support changes in Intel Quartus Prime Pro Edition Version 22.2.

Operating System Support Changes in Intel Quartus Prime Pro Edition Version 22.1

Support for the following operating systems is removed as of Intel Quartus Prime Pro Edition Version 22.1:

- CentOS Linux 7.5
- CentOS Linux 8.0(1)
- CentOS Linux 8.1(1)
- Red Hat* Enterprise Linux* 7
- Red Hat Enterprise Linux 8.0(2)
- Red Hat Enterprise Linux 8.1(2)
- Windows Server 2012

Operating System Support Changes in Intel Quartus Prime Pro Edition Version 21.4

Support for the following operating systems is deprecated as of Intel Quartus Prime Pro Edition Version 21.4:

- CentOS Linux 7.5
- Red Hat Enterprise Linux 7
- Windows Server 2012

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

Related Information

Operating System Support

1.4. 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.

(1) CentOS Linux 8.2 remains supported by Intel Quartus Prime Pro Edition Version 22.1

(2) Red Hat* Enterprise Linux 8.2 remains supported by Intel Quartus Prime Pro Edition Version 22.1

Table 2. Memory Requirements for Processing Designs

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

Family	Device	Recommended Physical RAM
Intel Agilex	AGFA022, AGFA023, AGFA027 AGFB022, AGFB023, AGFB027 AGFC023 AGFD023 AGIA023, AGIA035, AIGA040 AGIB022, AGIB023, AGIB027 AGIC023, AGIC035, AGIC040 AGID023	64 GB
	AGFA019, AGFB019, AGFC019, AGFD019, AGIB019, AGID019	48 GB
	AGFA006, AGFA008, AGFA012, AGFA014 AGFB006, AGFB008, AGFB012, AGFB014	32 GB
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
Intel Cyclone® 10 GX	10CX85, 10CX105, 10CX150, 10CX220	18 GB
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

1.5. Intel Quartus Prime Licensing Information

If you use a floating license with Intel Quartus Prime Version 22.3, 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

1.6. Device Support and Pin-Out Status

Table 3. 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	AGFA012R24B, AGFA014R24B, AGFA019R25A, AGFA022R25A, AGFA023R25A, AGFA027R25A AGFB012R24B, AGFB014R24B, AGFB019R25A, AGFB022R25A, AGFB023R25A, AGFB027R25A AGFC019R25A, AGFC023R25A AGFD019R25A, AGFD023R25A
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

Table 4. 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	AGFA012R24A, AGFA012R24C-AA, AGFA014R24A, AGFA014R24A-R0, AGFA014R24C-AA, AGFA022R31C-AA, AGFA023R25A-R0, AGFA027R24C-R0, AGFA027R24C-R2, AGFA027R25A-R0, AGFA027R31C-AA, AGFA027R31C-R0 AGFB012R24A, AGFB012R24C-AA, AGFB014R24A, AGFB014R24A-R0, AGFB014R24C-AA, AGFB022R31C-AA, AGFB023R25A-R0, AGFB027R24C-R0, AGFB027R24C-R2, AGFB027R25A-R0, AGFB027R31C-AA, AGFB027R31C-R0 AGFC023R25A-R0 AGFD023R25A-R0 AGIA023R18A-R0, AGIA040R39A-R0 AGIB022R31B-AA, AGIB023R18A-R0, AGIB027R29A-R0, AGIB027R29A-R1, AGIB027R29A-R2, AGIB027R29A-R3, AGIB027R31B-AA, AGIB027R31B-R0 AGIC023R18A-R0, AGIC040R39A-R0 AGID023R18A-R0
Intel Stratix 10	1SD110P-S1 1SG280H-S3, 1SG280L-S3 1SX280H-S3, 1SX280L-S3

Table 5. Advance Device Support

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

Device Family	Devices
Intel Agilex	AGFA006R16A, AGFA006R24C, AGFA008R16A, AGFA008R24C, AGFA012R24C, AGFA014R24C, AGFA019R24C, AGFA019R31C, AGFA022R24C, AGFA022R31C, AGFA023R24C, AGFA023R31C, AGFA027R24C, AGFA027R31C, AGFB006R16A, AGFB006R24C, AGFB008R16A, AGFB008R24C, AGFB012R24C, AGFB014R24C, AGFB019R24C, AGFB019R31C, AGFB022R24C, AGFB022R31C, AGFB023R24C, AGFB023R31C, AGFB027R24C, AGFB027R31C AGFC019R24C, AGFC019R31C, AGFC023R24C, AGFC023R31C AGFD019R24C, AGFD019R31C, AGFD023R24C, AGFD023R31C AGIA035R39A, AGIA040R39A AGIB019R18A, AGIB019R31B, AGIB022R29A, AGIB022R31B, AGIB023R18A, AGIB023R31B, AGIB027R29A, AGIB027R29B, AGIB027R31B AGIC035R39A, AGIC040R39A AGID019R18A, AGID019R31B, AGID023R18A, AGID023R31B

Table 6. Initial Device Support

Compilation, simulation, and timing analysis support are provided for these devices. Programming files and pinout information are not generated for these devices in this release.

Device Family	Devices
No devices with this status in Intel Quartus Prime Pro Edition Version 22.3.	

1.6.1. Changes in Device Support

Starting with Intel Quartus Prime Version 20.1, a new device support level was introduced: ***Preliminary*** device support.

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

Devices with ***Final*** device support (previously *Full*) have finalized device models, bitstreams, and firmware.

The definitions of ***Initial*** and ***Advance*** device support levels are unchanged.

For information about known device issues and workarounds, refer to the Intel FPGA Knowledge Base.

F-Tile Support Changes

For Intel Agilex 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

New Device Support

Support for the following devices is added to Intel Quartus Prime Pro Edition Version 22.3 with **Advance** device support:

- AGFA019R31C, AGFA023R31C
- AGFB019R31C, AGFB023R31C
- AGFC019R31C, AGFC023R31C
- AGFD019R31C, AGFD023R31C
- AGIB027R29B

Support for the following devices is added to Intel Quartus Prime Pro Edition Version 22.3 with **Preliminary** device support:

- AGFA012R24C-AA, AGFA014R24C-AA, AGFA022R31C-AA, AGFA027R31C-AA
- AGFB012R24C-AA AGFB014R24C-AA AGFB022R31C-AA AGFB027R31C-AA
- AGIB022R31B-AA, AGIB027R31B-AA

Support for the following devices is added to Intel Quartus Prime Pro Edition Version 22.3 with **Final** device support:

- AGFC023R25A-AE, AGFD023R25A-AE

Changed Device Support

Support levels for devices remain unchanged for this release.

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

- AGIA023R18A-R0, AGIA040R39A-R0
- AGIB023R18A-R0
- AGIC023R18A-R0, AGIC040R39A-R0
- AGID023R18A-R0

1.7. 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 7. Timing Model, Power Model, and Device Status for Intel Agilex Devices

Device Family	Device	Timing Model Status	Power Model Status	Device Status
Intel Agilex	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
	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 AGIA035R39A, AGIA040R39A AGIB019R18A, AGIB019R31B, AGIB022R29A, AGIB022R31B, AGIB022R31B-AA, AGIB023R18A, AGIB023R31B, AGIB027R29A, AGIB027R29B, AGIB027R31B, AGIB027R31B-AA AGIC035R29A, AGIC040R39A AGID019R18A, AGID019R31B, AGID023R18A, AGID023R31B	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 AGIA023R18A-R0, AGIA040R39A-R0 AGIB023R18A-R0, AGIB027R29A-R0, AGIB027R29A-R1, AGIB027R29A-R2, AGIB027R29A-R3, AGIB027R31B-R0 AGIC023R18A-R0, AGIC040R39A-R0 AGID023R18A-R0	Preliminary	Preliminary	Preliminary

Table 8. 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 (3) (4)	Final – 17.0	Final – 17.0
	10AX048, 10AS048	Final – 16.0.2 (4)	Final – 17.0	Final – 17.0
	10AX057, 10AS057, 10AX066, 10AS066, 10AT090, 10AX090	Final – 16.0.1 (4)	Final – 16.0.1	Final – 16.0.1
	10AX115, 10AT115	Final – 16.0 (4)	Final – 16.0	Final – 16.0

Table 9. 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 10. 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

(3) Devices with a -1 speed grade were finalized in Intel Quartus Prime software version 17.0

(4) All military grade devices were finalized in Intel Quartus Prime software version 18.0.1.

1.8. IBIS Models

Table 11. IBIS Model Status for the Intel Quartus Prime Pro Edition Software Release Version 22.3

Device Family	IBIS Model Status
Intel Agilex	Refer to IBIS Models for Intel Devices.
Intel Arria 10	
Intel Cyclone 10 GX	
Intel Stratix 10	

Starting with the Intel Agilex 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.

1.9. EDA Interface Information

Table 12. Synthesis Tools Supporting the Intel Quartus Prime Pro Edition Software Release Version 22.3

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 22.3.
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 22.3.

Table 13. Simulation Tools Supporting the Intel Quartus Prime Pro Edition Software Release Version 22.3

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*	2021.10
Cadence* Xcelium* Parallel Logic Simulation	21.09.003 (Linux* only)
Questa-Intel FPGA Edition	2022.1
Siemens EDA Questa Advanced Simulator	2021.4
Synopsys VCS* and VCS MX	S-2021.09-1 (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

1.10. Antivirus Verification

The Intel Quartus Prime software release version 22.3 has been verified virus free with the following software:

Antivirus Verification Software

McAfee VirusScan Command Line for Linux64 Version: 7.0.0.477
AV Engine version: 6300.9389 for Linux64.
Dat set version: 10474 created Sep 18 2022

1.11. Software Issues Resolved

The following customer service requests were fixed or otherwise resolved in Intel Quartus Prime Pro Edition Version 22.3:

Table 14. Issues Resolved in the Intel Quartus Prime Pro Edition Version 22.3

Customer Service Request Numbers							
00412414	00421084	00436039	00476432	00490297	00529632	00545429	00555807
00595466	00598070	00604812	00606077	00617935	00632482	00634129	00637285
00641570	00646555	00649470	00652511	00654177	00656969	00662702	00667270
00670006	00670307	00673809	00675060	00676859	00679150	00681187	00681869
00683298	00683620	00685100	00690524	00690840	00691961	00694253	00694977
00695780	00696316	00696522	00700791	00701092	00702002	00703049	00703346
00703705	00703811	00704548	00705817	00705913	00706209	00706447	00706552
00706674	00707074	00707508	00708157	00708917	00710687	00711032	00711096
00711414	00712185	00712680	00713112	00713435	00714622	00714684	00716209
00718765	00721114	00723387	00728887	00729961	00731682	00733224	05361118

1.12. Software Patches Included in this Release

Intel Quartus Prime Pro Edition Version 22.3 contains the following patches for previous versions of Intel Quartus Prime Pro Edition software:

Table 15. Software Patches included in Intel Quartus Prime Pro Edition Version 22.3

Software Version	Patch	Customer Service Request Number
Intel Quartus Prime Version 22.2	0.18	00715603
Intel Quartus Prime Version 22.2	0.16fw	–
Intel Quartus Prime Version 22.2	0.14	00673809
Intel Quartus Prime Version 22.2	0.13	00707508
Intel Quartus Prime Version 22.2	0.09fw	00670307, 00695780
Intel Quartus Prime Version 22.2	0.08	00654177
Intel Quartus Prime Version 22.2	0.05	–
Intel Quartus Prime Version 22.2	0.04	00712185
Intel Quartus Prime Version 22.2	0.02	–
Intel Quartus Prime Version 22.1	0.28	–
Intel Quartus Prime Version 22.1	0.20	–
Intel Quartus Prime Version 22.1	0.19	00704548
Intel Quartus Prime Version 22.1	0.16	00696578
Intel Quartus Prime Version 22.1	0.14	00698119
Intel Quartus Prime Version 22.1	0.11	00703131
Intel Quartus Prime Version 21.4	0.66	00731682
Intel Quartus Prime Version 21.4	0.61fw	00670307, 00695780
Intel Quartus Prime Version 21.4	0.60	00712185
Intel Quartus Prime Version 21.4	0.59fw	00712865
Intel Quartus Prime Version 21.4	0.58	00696522
Intel Quartus Prime Version 21.4	0.57fw	00679150
Intel Quartus Prime Version 21.4	0.56	00681440
Intel Quartus Prime Version 21.4	0.38	–
Intel Quartus Prime Version 21.4	0.02	–
Intel Quartus Prime Version 21.3	0.47fw	00670307, 00695780
Intel Quartus Prime Version 21.3	0.46	00712680
Intel Quartus Prime Version 21.3	0.42	00654177
Intel Quartus Prime Version 21.3	0.40	00671791
Intel Quartus Prime Version 21.3	0.36	00691961
Intel Quartus Prime Version 21.3	0.25	–
Intel Quartus Prime Version 21.2	0.46fw	–

continued...

Software Version	Patch	Customer Service Request Number
Intel Quartus Prime Version 21.2	0.45	00713112
Intel Quartus Prime Version 21.2	0.42	00683298
Intel Quartus Prime Version 21.1	0.62	00636176
Intel Quartus Prime Version 20.4	0.49	00689592
Intel Quartus Prime Version 20.3	0.84	00707074
Intel Quartus Prime Version 20.3	0.80	00681440

1.13. Latest Known Intel Quartus Prime Software Issues

Information about known issues that affect Intel Quartus Prime Pro Edition Version 22.3 is available in the Intel FPGA Knowledge Base.

For the latest information about issues that affect Intel Quartus Prime Pro Edition Version 22.3, review the Intel FPGA Knowledge Base articles that apply to Intel Quartus Prime Pro Edition Version 22.3.

Table 16. Important Known Issues Affecting Intel Quartus Prime Pro Edition Version 22.3

Description	Workaround
For Intel Agilex AGI035-R0 and AGI040-R0 devices, configuration does not work. This issue affects all configuration modes.	Review the Intel FPGA Knowledge Base articles that apply to Intel Quartus Prime Pro Edition Version 22.3 and locate the article that contains a patch for this issue.

For designs that include Nios® II Processor IP and Mailbox Client Intel FPGA IP, you might get the following error when you compile your software design after you generate a new BSP:
`Error: 'none' undeclared (first use in this function). drivers/src/librsu_cfg.c:87:20: note: in expansion of macro 'RSU_PROTECTION_SLOT'`
For more details, refer to the Intel FPGA Knowledge Base article at the following URL:
https://www.intel.com/content/www/us/en/support/programmable/articles/000092331.html
	To prevent this error:
	1. In the project directory, open the following file in a text editor:
	`software/bsp/public.mk`
	2. Comment out the `DRSU_PROTECTION_SLOT` parameter as follows:
	`#ALT_CPPFLAGS += -DRSU_PROTECTION_SLOT=none`
	3. Save your changes.

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

1.14. 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.

1.15. Intel Quartus Prime Pro Edition Software Release Version 22.3 Document Revision History

Document Version	Intel Quartus Prime Version	Changes
2022.11.21	22.3	Corrected the supported version in EDA Interface Information on page 15 for the following simulation tools: • Cadence Xcelium Parallel Logic Simulation • Siemens EDA Questa Advanced Simulator
2022.09.26	22.3	• Initial release.