

This document provides late-breaking information about the Altera® Quartus® II software version 13.0.

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For information about operating system support, refer to the **readme.txt** file in your **altera/<version number>/quartus** directory. For the latest information about the MegaCore® IP Library, refer to the *MegaCore IP Library Release Notes and Errata*.



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## New Features & Enhancements

The Quartus II software version 13.0 includes the following new features and enhancements:

- Enhanced device support:
  - Full device support for the following Arria® V devices: 5AGXA1, 5AGXA3, and 5AGTC3
  - Full device support for the following Cyclone® V devices: Cyclone V: 5CEA2, 5CEA4, 5CEA7, 5CGXC7, 5CGTD7, and 5CGTD9
  - Full device support for the following Stratix® V devices: 5SGSD6, and 5SGSD8
  - Advance device support for the following Arria V devices: 5AGXA5, 5AGXA7, and 5AGTC7
  - Advance device support for the following Cyclone V devices: 5CEA5, 5CGXC3, 5CGXC4, and 5CGXC5
- Simplified software and device family installation with a new installer
- An average 25% faster compilation time
- Support for eight-core multiprocessing
- Enhancements to the Qsys system integration tool, including:
  - Support for ARM® TrustZone® technology plus Advanced Peripheral Bus (APB™)
  - Support for VHDL bus functional models (BFMs)
- Enhancements to the Transceiver Toolkit, including:
  - Bit error checking for Stratix V FPGAs
  - Measurement and reporting of the data rates of each active transceiver channel
- Enhancements to the SignalTap™ II Logic Analyzer, including:
  - Changing basic trigger operations without recompiling.
  - Cross-triggering from an Altera SoC hard processor (HPS) event.
- A new software notification center that:
  - allows you to monitor compilations remotely from a web browser
  - allows you to receive status emails about your Quartus II software compilations
- You can use the Quartus II Help with the following browsers:
  - Local Quartus II Help is fully compatible with Mozilla Firefox 3.6 running on Linux 32-bit systems.
  - Quartus II Web Help (hosted at <http://quartushelp.altera.com/current>) is fully compatible with Google Chrome, Safari 5, Microsoft Internet Explorer 9, and Mozilla Firefox 20.0.
  - Some Help features require that you to disable pop-up blocking.

## Memory Recommendations

A full installation of the Quartus II software requires up to 18 GB of available disk space on the drive or partition where you are installing the Altera software.

The Quartus II Stand-Alone Programmer requires a minimum of 1 GB of RAM plus additional memory, based on the size and number of SRAM Object Files (.sof) files and the size and number of devices being configured.

Altera recommends that your system be configured to provide virtual memory equal to the recommended physical RAM that is required to process your design.

The following table lists the memory required to process designs targeted for Altera devices.

| Family         | Device                                 | Recommended Physical RAM |         |
|----------------|----------------------------------------|--------------------------|---------|
|                |                                        | 32-bit                   | 64-bit  |
| Arria GX       | EP1AGX20                               | 512 MB                   | 512 MB  |
|                | EP1AGX35, EP1AGX50, EP1AGX60           | 1.0 GB                   | 1.5 GB  |
|                | EP1AGX90                               | 1.5 GB                   | 2.0 GB  |
| Arria II GX    | EP2AGX45                               | 1.0 GB                   | 1.5 GB  |
|                | EP2AGX65                               | 1.5 GB                   | 2.0 GB  |
|                | EP2AGX95, EP2AGX125, EP2AGX190         | 3.0 GB                   | 4.0 GB  |
|                | EP2AGX260                              | 4.0 GB                   | 6.0 GB  |
| Arria II GZ    | EP2AGZ225                              | 3.0 GB                   | 4.0 GB  |
|                | EP2AGZ300                              | 4.0 GB                   | 6.0 GB  |
|                | EP2AGZ350                              | Not recommended          | 8.0 GB  |
| Arria V        | 5AGXA1                                 | Not recommended          | 6.0 GB  |
|                | 5AGTC3, 5AGXA3, 5AGXA5                 | Not recommended          | 8.0 GB  |
|                | 5AGXA7, 5AGTC7                         | Not recommended          | 10.0 GB |
|                | 5AGXB1, 5AGXB3, 5AGTD3, 5ASTD3, 5ASXB3 | Not recommended          | 12.0 GB |
|                | 5AGXB5, 5AGTD7, 5AGXB7, 5ASXB5, 5ASTD5 | Not recommended          | 16.0 GB |
| Arria V GZ     | 5AGZE1                                 | Not recommended          | 8.0 GB  |
|                | 5AGZE3, 5AGZE5                         | Not recommended          | 12.0 GB |
|                | 5AGZE7                                 | Not recommended          | 16.0 GB |
| Cyclone        | All                                    | 512 MB                   | 512 MB  |
| Cyclone II     | EP2C5, EP2C8, EP2C15, EP2C20           | 512 MB                   | 512 MB  |
|                | EP2C35, EP2C50                         | 1.0 GB                   | 1.5 GB  |
|                | EP2C70                                 | 1.5 GB                   | 2.0 GB  |
| Cyclone III    | EP3C5, EP3C10, EP3C16, EP3C25, EP3C40  | 512 MB                   | 512 MB  |
|                | EP3C55, EP3C80                         | 768 MB                   | 1.0 GB  |
|                | EP3C120                                | 1.5 GB                   | 2.0 GB  |
| Cyclone III LS | EP3CLS70, EP3CLS100                    | 1.5 GB                   | 2.0 GB  |
|                | EP3CLS150, EP3CLS200                   | 3.0 GB                   | 4.0 GB  |

| Family        | Device                                                                                                                                                     | Recommended Physical RAM |         |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|---------|
|               |                                                                                                                                                            | 32-bit                   | 64-bit  |
| Cyclone IV E  | EP4CE6, EP4CE10, EP4CE15, EP4CE22, EP4CE30, EP4CE40                                                                                                        | 512 MB                   | 512 MB  |
|               | EP4CE55, EP4CE75                                                                                                                                           | 768 MB                   | 1.0 GB  |
|               | EP4CE115                                                                                                                                                   | 1.0 GB                   | 1.5 GB  |
| Cyclone IV GX | EP4CGX15, EP4CGX22, EP4CGX30                                                                                                                               | 512 MB                   | 512 MB  |
|               | EP4CGX50, EP4CGX75                                                                                                                                         | 1.0 GB                   | 1.5 GB  |
|               | EP4CGX110, EP4CGX150                                                                                                                                       | 1.5 GB                   | 2.0 GB  |
| Cyclone V     | 5CEA2, 5CGXC3, 5CEA4, 5CGXC4, 5CEA5, 5CGTD5, 5CGXC5, 5CSEA5, 5CSTD5, 5CSXC5, 5CSEA6, 5CSXC6, 5CEA7, 5CGTD7, 5CGXC7, 5CSEA2, 5CSEA4, 5CSXC2, 5CSXC4, 5CSTD6 | Not recommended          | 6.0 GB  |
|               | 5CEA9, 5CGTD9, 5CGXC9, ,                                                                                                                                   | Not recommended          | 8.0 GB  |
| HardCopy® II  | HC210, HC210W                                                                                                                                              | 1.5 GB                   | 2.0 GB  |
|               | HC220, HC230, HC240                                                                                                                                        | 3.0 GB                   | 4.0 GB  |
| HardCopy III  | HC325                                                                                                                                                      | Not recommended          | 8.0 GB  |
|               | HC335                                                                                                                                                      |                          | 12.0 GB |
| HardCopy IV   | HC4E25                                                                                                                                                     | Not recommended          | 8.0 GB  |
|               | HC4GX15                                                                                                                                                    |                          | 12.0 GB |
|               | HC4E35, HC4GX25                                                                                                                                            |                          | 16.0 GB |
|               | HC4GX35                                                                                                                                                    |                          | 20.0 GB |
| MAX®          | All                                                                                                                                                        | 512 MB                   | 512 MB  |
| MAX II        | All                                                                                                                                                        | 512 MB                   | 512 MB  |
| MAX V         | All                                                                                                                                                        | 512 MB                   | 512 MB  |
| Stratix       | EP1S10, EP1S20                                                                                                                                             | 512 MB                   | 512 MB  |
|               | EP1S25, EP1S30, EP1S40, EP1S60                                                                                                                             | 1.0 GB                   | 1.5 GB  |
|               | EP1S80                                                                                                                                                     | 1.5 GB                   | 2.0 GB  |
| Stratix GX    | EP1SGX10                                                                                                                                                   | 512 MB                   | 512 MB  |
|               | EP1SGX25, EP1SGX40                                                                                                                                         | 1.0 GB                   | 1.5 GB  |
| Stratix II    | EP2S15                                                                                                                                                     | 512 MB                   | 512 MB  |
|               | EP2S30                                                                                                                                                     | 1.0 GB                   | 1.5 GB  |
|               | EP2S60, EP2S90                                                                                                                                             | 1.5 GB                   | 2.0 GB  |
|               | EP2S130, EP2S180                                                                                                                                           | 3.0 GB                   | 4.0 GB  |
| Stratix II GX | EP2SGX30, EP2SGX60                                                                                                                                         | 1.0 GB                   | 1.5 GB  |
|               | EP2SGX90                                                                                                                                                   | 1.5 GB                   | 2.0 GB  |
|               | EP2SGX130                                                                                                                                                  | 3.0 GB                   | 4.0 GB  |
| Stratix III   | EP3SL50, EP3SE50, EP3SL70                                                                                                                                  | 1.0 GB                   | 1.5 GB  |
|               | EP3SE80                                                                                                                                                    | 1.5 GB                   | 2.0 GB  |
|               | EP3SL110, EP3SE110, EP3SL150, EP3SL200                                                                                                                     | 3.0 GB                   | 4.0 GB  |
|               | EP3SE260, EP3SL340                                                                                                                                         | 4.0 GB                   | 6.0 GB  |

| Family     | Device                                                   | Recommended Physical RAM |         |
|------------|----------------------------------------------------------|--------------------------|---------|
|            |                                                          | 32-bit                   | 64-bit  |
| Stratix IV | EP4SGX70                                                 | 1.5 GB                   | 2.0 GB  |
|            | EP4SE230<br>EP4SGX110, EP4SGX230, EP4S40G2,<br>EP4S100G2 | 3.0 GB                   | 4.0 GB  |
|            | EP4SGX290                                                | 4.0 GB                   | 6.0 GB  |
|            | EP4SE360<br>EP4SGX360, EP4S100G3, EP4S100G4              | Not recommended          | 8.0 GB  |
|            | EP4SGX530, EP4SE530, EP4SE820,<br>EP4S40G5, EP4S100G5    | Not recommended          | 12.0 GB |
| Stratix V  | 5SGSD3                                                   | Not recommended          | 8.0 GB  |
|            | 5SGXA3, 5SGSD4, 5SGXA4, 5SGTC5                           | Not recommended          | 12.0 GB |
|            | 5SGSD5, 5SGXA5, 5SGXB5, 5SGSD6, 5SGXB6                   | Not recommended          | 16.0 GB |
|            | 5SGTC7, 5SGXA7, 5SGSD8                                   | Not recommended          | 20.0 GB |
|            | 5SGXA9, 5SEE9                                            | Not recommended          | 24.0 GB |
|            | 5SEEB, 5SGXAB, 5SGXB9, 5SGXBB                            | Not recommended          | 28.0 GB |

## Changes in Device Support

The following section is divided into device support changes according to whether the change is a notification, and whether the change has been fixed or not fixed.

| Description                                                                                                                                                                                                                                                                                                                                                                                                                                          | Workaround                                                                                                                                                                                                                                                                                                            |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Change Notifications</b>                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                       |
| <b>Device Support Not Fixed</b>                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                       |
| <b>VCS Internal Errors</b><br>PCIe regtests may fail randomly due to VCS internal errors.                                                                                                                                                                                                                                                                                                                                                            | You must re-run VCS in the event of a failed PCIe regtest.                                                                                                                                                                                                                                                            |
| <b>Quartus II does not automatically detect and update PCIe IP core</b><br>When creating a design with a PCI express (PCIe) intellectual property (IP) core in Qsys prior to version 12.1, the Regenerate IP Component feature in the Quartus II software cannot automatically detect and update the PCIe IP core to the current version. Qsys systems must be upgraded manually because compilation errors might occur with outdated PCIe IP cores. | Prior to compilation, you must regenerate the Qsys system. With your project opened in the Quartus II software: <ol style="list-style-type: none"> <li>1. Click <b>Tools &gt; Qsys</b> to open the Qsys window.</li> <li>2. Click the <b>Generation</b> tab.</li> <li>3. Click the <b>Generate</b> button.</li> </ol> |

| Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Workaround                                                                                                                                                          |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Device Support Fixed</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                     |
| <p><b>Arria V timing models have changed</b></p> <p>Arria V timing models have changed. Some of these changes affect devices which had been at "Final" timing status.</p>                                                                                                                                                                                                                                                                                                                                                                                                                         | <p>Updates were made to the final timing models. Refer to solution number <a href="#">rd04252013_701</a> in the Altera Knowledge Base.</p>                          |
| <p><b>Stratix V timing models changed in the Quartus II software version 12.1 SP1</b></p> <p>Stratix V timing models changed in the Quartus II software version 12.1 SP1. Some of these changes affect devices that had been at "Final" timing status.</p>                                                                                                                                                                                                                                                                                                                                        | <p>Updates were made to the final timing models. Refer to solution number <a href="#">rd11162012_922</a> in the Altera Knowledge Base.</p>                          |
| <p><b>Stratix V timing model change: clr input of M20K blocks</b></p> <p>The <code>clr</code> input of M20K memories, when driven directly by a global, regional, or periphery clock buffer is not analyzed by the TimeQuest timing analyzer in the Quartus II software version 12.1 SP1 and earlier. This change affects devices that had been at "Final" timing status.</p>                                                                                                                                                                                                                     | <p>Updates were made to the final timing models. Refer to solution number <a href="#">rd02202013_401</a> in the Altera Knowledge Base.</p>                          |
| <p><b>Stratix V timing model change: Logic and routing delays</b></p> <p>A software error in the Quartus II software version 12.1 SP1 and earlier caused minor timing modeling errors for some logic and routing delays (typically &lt; 20 ps). This change affects devices that had been at "Final" timing status.</p>                                                                                                                                                                                                                                                                           | <p>Updates were made to the final timing models. Refer to solution number <a href="#">rd02202013_401</a> in the Altera Knowledge Base.</p>                          |
| <p><b>VCCRSTCLK_HPS pin labelled incorrectly</b></p> <p>The <code>VCCRSTCLK_HPS</code> pin was incorrectly labelled as "<code>VCC_HPS</code>." Applies to some Cyclone V SoC devices.</p>                                                                                                                                                                                                                                                                                                                                                                                                         | <p>Refer to the updated pinout table to identify both <code>VCCRSTCLK_HPS</code> pins.</p>                                                                          |
| <p><b>Ordering Part Number (OPN) change for Cyclone V E50 devices.</b></p> <p>Some OPNs have been identified as incorrect.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | <p>5CEFA2 devices become 5CEBA2 devices<br/>5CEFA4 devices become 5CEBA4 devices</p>                                                                                |
| <p><b>Quartus II software restricting ATX PLL range issue</b></p> <p>The Quartus II software does not restrict the ATX PLL range to the current performance specifications, which are documented in the current errata sheet for Stratix V devices on the Altera website. The Quartus II software assumes that all the ATX PLLs have exactly the same data rate performance. Therefore it is possible for the Fitter to implement an ATX PLL with settings outside the performance specifications of your selected device and assigned ATX PLL location.</p> <p>Applies to Stratix V devices.</p> | <p>Ensure that your design compiles with the specifications in the errata sheet. You may need to manually assign ATX PLLs in your design to specific locations.</p> |
| <p><b>No pipe_pclk output issue</b></p> <p>The <code>pipe_pclk</code> clock cannot be activated on a non-global clock.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <p>The <code>pipe_pclk</code> clock must be on a global clock signal to function properly.</p>                                                                      |
| <p><b>CPRI placement on restricted triplet issue</b></p> <p>Previous restrictions on Ch0, Ch1, and Ch2 in <code>GXB_L0</code> and <code>GXB_R0</code> is updated in the Quartus II software 12.1. Ch0 in both <code>GXB_L0</code> and <code>GXB_R0</code> is now available for deterministic latency protocols.</p> <p>Applies to Arria V devices</p>                                                                                                                                                                                                                                             | <p>—</p>                                                                                                                                                            |

| Description                                                                                                                                                                                                                                                                                                                                                                                                                       | Workaround                                      |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|
| <p><b>Stratix V ATX PLL loses lock</b></p> <p>In versions of the Quartus II software prior to version 13.0, re-calibration of an unlocked ATX PLL on the same side of a Stratix V device as a locked ATX PLL might cause the locked ATX PLL to lose its lock.</p>                                                                                                                                                                 | <p>Use the Quartus II software version 13.0</p> |
| <p><b>Stratix V ATX PLL stuck in nonoptimal gear</b></p> <p>In versions of the Quartus II software prior to version 13.0, Stratix V ATX PLLs might get stuck in a nonoptimal gear after an unsuccessful calibration. An unsuccessful calibration might occur if your system does not provide a stable REFCLK for calibration or if your design keeps an ATX PLL under reset during calibration.</p>                               | <p>Use the Quartus II software version 13.0</p> |
| <p><b>Incorrect VCCT/R_GXB recommendation in a Quartus II-generated .pin file when using Stratix V ATX PLL</b></p> <p>In Stratix V devices, the VCCT/R_GXB power supply requires 1.0 V nominal whenever an ATX PLL is used, regardless of data rates. In versions of the Quartus II software prior to version 13.0, the .pin file generated for data rates up to 6.5 Gbps incorrectly included 0.85 V/0.9 V instead of 1.0 V.</p> | <p>Use the Quartus II software version 13.0</p> |

## Changes to Software Behavior

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

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

Items listed in the following table represent cases in which the behavior of the current release of the Quartus II software is different from a previous version.

| Description                                                                                            | Workaround                                                                                                                             |
|--------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|
| The Rapid Recompile feature is disabled in this release.                                               | There is no workaround.                                                                                                                |
| SOPC Builder is not provided with the Quartus II software and will not be provided in future versions. | Use Qsys. For guidelines to migrate your design from SOPC Builder to Qsys, refer to <i>SOPC Builder to Qsys Migration Guidelines</i> . |

## Device Support and Pin-Out Status

This section contains information about the device support status in the Quartus II software version 13.0.

### Full Device Support

Full compilation, simulation, timing analysis, and programming support is now available for the new devices listed in the following table.

| Device Family | Devices  |          |
|---------------|----------|----------|
| Arria V       | 5AGXA1   | 5AGXA3   |
|               | 5AGXA5   | 5AGXA7   |
|               | 5AGXB1   | 5AGXB3   |
|               | 5AGXB5   | 5AGXB7   |
|               | 5AGTC3   | 5AGTC7   |
|               | 5AGTD3   | 5AGTD7   |
| Arria V GZ    | 5AGZE1   | 5AGZE3   |
|               | 5AGZE5   | 5AGZE7   |
| Cyclone V     | 5CEA2    | 5CEA4    |
|               | 5CEA5    | 5CEA7    |
|               | 5CEA9    | 5CGXC3   |
|               | 5CGXC4   | 5CGXC5   |
|               | 5CGXC7   | 5CGXC9   |
|               | 5CGTD5   | 5CGTD7   |
|               | 5CGTD9   | 5CGXC7ES |
|               | 5CEA7ES  | 5CSEA6ES |
|               | 5CSXC6ES | —        |
| Stratix V     | 5SEE9    | 5SEEB    |
|               | 5SGXA9   | 5SGXAB   |
|               | 5SGXB5   | 5SGXB6   |
|               | 5SGXB9   | 5SGXBB   |
|               | 5SGSD6   | 5SGSD8   |

## Advance Device Support

Compilation, simulation, and timing analysis support is provided for the devices listed in [Table 1](#) that will be released in the near future. The Compiler generates pin-out information for these devices in this release, but does not generate programming files.

**Table 1. Devices with Advance Support**

| Device Family | Devices |        |
|---------------|---------|--------|
| Arria V       | 5AGXA5  | 5AGXA7 |
|               | 5AGTC7  | 5ASXB3 |
|               | 5ASXB5  | 5ASTD3 |
|               | 5ASTD5  | —      |
| Cyclone V     | 5CSEA5  | 5CSEA6 |
|               | 5CSXC5  | 5CSXC6 |
|               | 5CSTD5  | 5CSTD6 |

## Initial Information Device Support

Compilation, simulation, and timing analysis support is provided for the devices listed in Table 2 that will be released in upcoming versions of the Quartus II software. Programming files and pin-out information are not generated for these devices in this release.

**Table 2. Devices with Initial Information Support**

| Device Family | Devices |   |
|---------------|---------|---|
| None          | —       | — |

## Timing and Power Models

Table 3 lists a summary of timing and power model status in the current version of the Quartus II software.

**Table 3. Devices with Timing and Power Models**

| Device Family  | Device    | Timing Model Status   | Power Model Status |
|----------------|-----------|-----------------------|--------------------|
| Arria II GX    | All       | Correlated – 10.0 SP1 | Final – 10.0       |
| Arria II GZ    | All       | Final – 10.1          | Final – 10.1       |
| Arria V        | 5AGXB5    | Final – 12.1 SP1 (3)  | Preliminary        |
|                | 5AGXB7    | Final – 12.1 SP1 (3)  | Preliminary        |
|                | 5AGTD7    | Final – 12.1 SP1 (3)  | Preliminary        |
|                | 5AGXA1    | Preliminary           | Preliminary        |
|                | 5AGXA3    | Preliminary           | Preliminary        |
|                | 5AGXA5    | Preliminary           | Preliminary        |
|                | 5AGXA7    | Preliminary           | Preliminary        |
|                | 5AGXB1    | Final 13.0            | Preliminary        |
|                | 5AGXB3    | Final 13.0            | Preliminary        |
|                | 5AGTD3    | Final 13.0            | Preliminary        |
| Arria V GZ     | All       | Final – 12.1 SP1 (3)  | Final 13.0         |
| Cyclone III LS | All       | Final – 10.0          | Final – 10.0 SP1   |
| Cyclone IV E   | All       | Final – 10.0 SP1      | Final – 10.0 SP1   |
| Cyclone IV GX  | EP4CGX15  | Final – 10.1          | Final – 11.0       |
|                | EP4CGX22  | Final – 11.0          |                    |
|                | EP4CGX30  |                       | Final – (1)        |
|                | EP4CGX50  | Final – 11.0          | Final –11.1        |
|                | EP4CGX75  |                       |                    |
|                | EP4CGX110 | Final – 10.1          | Final – 11.0       |
|                | EP4CGX150 |                       |                    |
| Cyclone V      | All       | Preliminary           | Preliminary        |
| HardCopy III   | All       | Correlated – 11.1     | Correlated – 12.0  |
| HardCopy IV E  | All       | Correlated – 11.1     | Correlated – 12.0  |

**Table 3. Devices with Timing and Power Models (Continued)**

| Device Family                                                                                                                                                                                                                                                                                                                                         | Device                                                                                                              | Timing Model Status          | Power Model Status |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|------------------------------|--------------------|
| HardCopy IV GX                                                                                                                                                                                                                                                                                                                                        | All                                                                                                                 | Correlated – 11.1            | Correlated – 12.0  |
| MAX V                                                                                                                                                                                                                                                                                                                                                 | All                                                                                                                 | Final – 11.0                 | Final – 11.0       |
| Stratix IV                                                                                                                                                                                                                                                                                                                                            | All                                                                                                                 | Correlated – 10.0<br>SP1 (2) | Final – 10.1       |
| Stratix V                                                                                                                                                                                                                                                                                                                                             | 5SGXA7, 5SGXA5,<br>5SGTC5, 5SGTC7                                                                                   | Final – 12.1 (3)             | Final 13.0         |
|                                                                                                                                                                                                                                                                                                                                                       | 5SGSD3, 5SGSD4,<br>5SGSD5, 5SGXA3,<br>5SGXA4, 5SGXB5,<br>5SGXB6, 5SGXAB,<br>5SGXA9, 5SEE9, 5SEEB,<br>5SGXB9, 5SGXBB | Final – 12.1 SP1 (3)         | Final 13.0         |
|                                                                                                                                                                                                                                                                                                                                                       | 5SGSD6, 5SGSD8                                                                                                      | Preliminary                  | Final 13.0         |
| <b>Notes to Table 3:</b><br>(1) EP4CGX30BF14 and EP4CGX30CF19 are final in 11.0, EP4CGX30CF23 final in 11.1.<br>(2) The timing model is updated for PMA Direct transceiver timing in Quartus II software release 12.0.<br>(3) The timing model is updated in Quartus II software version 13.0. Refer to the Device Support Fixed section for details. |                                                                                                                     |                              |                    |

The current version of the Quartus II software also includes final timing and power models for the Arria GX, Arria II GX, Cyclone, Cyclone II, Cyclone III, Cyclone III LS, Cyclone IV E, HardCopy II, MAX, MAX II, MAX IIZ, Stratix, Stratix GX, Stratix II, Stratix II GX, Stratix III, and Stratix IV device families. Timing models for these device families became final in the Quartus II software versions 10.1 or earlier.

## EDA Interface Information

The Quartus II software version 13.0 supports the following EDA tools.

| <b>Synthesis Tools</b>                                  | <b>Version</b>            | <b>NativeLink Support</b> |
|---------------------------------------------------------|---------------------------|---------------------------|
| Mentor Graphics Precision RTL Synthesis                 | 2013a                     | ✓                         |
| Synopsys Synplify, Synplify Pro, and Synplify Premier   | E-2013.03-SP1             | ✓                         |
| <b>Simulation Tools</b>                                 | <b>Version</b>            | <b>NativeLink Support</b> |
| Aldec Active-HDL                                        | 9.2<br>(Windows only)     | ✓                         |
| Aldec Riviera-PRO                                       | 2012.10                   | ✓                         |
| Cadence INCISIV Enterprise Simulator                    | 12.10.013<br>(Linux only) | ✓                         |
| Mentor Graphics ModelSim®                               | 10.1d                     | ✓                         |
| Mentor Graphics ModelSim-Altera                         | 10.1d                     | ✓                         |
| Mentor Graphics Questa®                                 | 10.1d                     | ✓                         |
| Synopsys VCS and VCS MX                                 | 2012.09-3                 | ✓                         |
| <b>Formal Verification Tools (Equivalence Checking)</b> | <b>Version</b>            | <b>NativeLink Support</b> |
| Cadence Encounter Conformal                             | 8.1                       | —                         |

## Antivirus Verification

The Altera Complete Design Suite version 13.0 has been verified virus free using the following software:

AVG Version: 2013.0.3272

Virus database version: 3162/1

LinkScanner version: 1591

McAfee VirusScan Enterprise + AntiSpyware Enterprise Version: 8.8

Scan Engine Version: 5400.1158

DAT Version: 7042.0000

## Software Issues Resolved

The following Customer Service Requests were fixed or otherwise resolved in the Quartus II software version 13.0:

| Customer Service Request Numbers Resolved in the Quartus II Software Version 13.0 |          |          |          |          |          |          |          |
|-----------------------------------------------------------------------------------|----------|----------|----------|----------|----------|----------|----------|
| 10826903                                                                          | 10836354 | 10836659 | 10838069 | 10839633 | 10840755 | 10840791 | 10840905 |
| 10841247                                                                          | 10843327 | 10843529 | 10844511 | 10846989 | 10847001 | 10847461 | 10848017 |
| 10848719                                                                          | 10849302 | 10849878 | 10849935 | 10851552 | 10851560 | 10854054 | 10854461 |
| 10854601                                                                          | 10854894 | 10855563 | 10855593 | 10855735 | 10856538 | 10856900 | 10857446 |
| 10857457                                                                          | 10857972 | 10858157 | 10858350 | 10858663 | 10859341 | 10859745 | 10860351 |
| 10861193                                                                          | 10861638 | 10861715 | 10862004 | 10862023 | 10862430 | 10862814 | 10863233 |
| 10864470                                                                          | 10864817 | 10864821 | 10866399 | 10867325 | 10867583 | 10868007 | 10868656 |
| 10868695                                                                          | 10869086 | 10869866 | 10870632 | 10870634 | 10870672 | 10870738 | 10870890 |
| 10871110                                                                          | 10871757 | 10871903 | 10872095 | 10872333 | 10872347 | 10872441 | 10872508 |
| 10872684                                                                          | 10872860 | 10872865 | 10872890 | 10872920 | 10873162 | 10873554 | 10873763 |
| 10873777                                                                          | 10873944 | 10873949 | 10874020 | 10874196 | 10874596 | 10874604 | 10874668 |
| 10874822                                                                          | 10875257 | 10875332 | 10875702 | 10875806 | 10875855 | 10876139 | 10876462 |
| 10876828                                                                          | 10877087 | 10877102 | 10877218 | 10877386 | 10877553 | 10877772 | 10877825 |
| 10878157                                                                          | 10878203 | 10878330 | 10879111 | 10879138 | 10879190 | 10879447 | 10879598 |
| 10879734                                                                          | 10879916 | 10880138 | 10880232 | 10880521 | 10880651 | 10880654 | 10880675 |
| 10881404                                                                          | 10881797 | 10881806 | 10882228 | 10882327 | 10882941 | 10883041 | 10883081 |
| 10883389                                                                          | 10883455 | 10883820 | 10883917 | 10884107 | 10884395 | 10884579 | 10884608 |
| 10884796                                                                          | 10884822 | 10884915 | 10885007 | 10885157 | 10885252 | 10885331 | 10885477 |
| 10886634                                                                          | 10886651 | 10886665 | 10886750 | 10887004 | 10887581 | 10887668 | 10888014 |
| 10888063                                                                          | 10888803 | 10889107 | 10889273 | 10889318 | 10889334 | 10889806 | 10889842 |
| 10889849                                                                          | 10890043 | 10890684 | 10891322 | 10891664 | 10891684 | 10892125 | 10892342 |
| 10892688                                                                          | 10892905 | 10893017 | 10893362 | 10893581 | 10894135 | 10894332 | 10894643 |
| 10895077                                                                          | 10895314 | 10895493 | 10895523 | 10895935 | 10896144 | 10896145 | 10896167 |
| 10896400                                                                          | 10896467 | 10897058 | 10897089 | 10897100 | 10897443 | 10897575 | 10897600 |
| 10897681                                                                          | 10897989 | 10898207 | 10898288 | 10898369 | 10898455 | 10898496 | 10898656 |
| 10898899                                                                          | 10899108 | 10899290 | 10899498 | 10899602 | 10899949 | 10900020 | 10900042 |
| 10900058                                                                          | 10900391 | 10900485 | 10900555 | 10901034 | 10901039 | 10901089 | 10901116 |

| Customer Service Request Numbers Resolved in the Quartus II Software Version 13.0 |          |          |          |          |          |          |          |
|-----------------------------------------------------------------------------------|----------|----------|----------|----------|----------|----------|----------|
| 10901361                                                                          | 10901445 | 10901641 | 10901770 | 10902069 | 10902155 | 10902161 | 10902207 |
| 10902338                                                                          | 10902380 | 10902390 | 10902566 | 10902632 | 10902880 | 10902917 | 10903133 |
| 10903206                                                                          | 10903219 | 10903244 | 10903434 | 10903621 | 10903692 | 10903694 | 10903731 |
| 10904318                                                                          | 10904461 | 10904491 | 10904720 | 10904790 | 10904793 | 10904882 | 10904951 |
| 10905082                                                                          | 10905623 | 10905673 | 10906340 | 10906483 | 10906535 | 10906995 | 10907386 |
| 10907518                                                                          | 10907545 | 10907557 | 10907623 | 10907737 | 10907784 | 10907977 | 10908107 |
| 10908226                                                                          | 10908246 | 10908248 | 10908272 | 10908372 | 10908666 | 10908742 | 10908751 |
| 10908831                                                                          | 10908950 | 10909153 | 10909279 | 10909289 | 10909426 | 10909485 | 10909660 |
| 10909756                                                                          | 10909829 | 10909830 | 10909865 | 10909878 | 10909962 | 10910063 | 10910084 |
| 10910194                                                                          | 10910303 | 10910530 | 10910633 | 10910770 | 10910774 | 10910849 | 10910897 |
| 10910979                                                                          | 10911157 | 10911202 | 10911282 | 10911309 | 10911341 | 10911361 | 10911369 |
| 10911439                                                                          | 10911537 | 10911624 | 10911719 | 10911918 | 10911939 | 10911980 | 10911989 |
| 10912109                                                                          | 10912124 | 10912166 | 10912216 | 10912258 | 10912598 | 10912622 | 10912624 |
| 10912818                                                                          | 10912863 | 10912864 | 10912979 | 10913009 | 10913058 | 10913373 | 10913388 |
| 10913403                                                                          | 10913479 | 10913664 | 10913810 | 10913901 | 10913975 | 10914063 | 10914139 |
| 10914198                                                                          | 10914201 | 10914216 | 10914228 | 10914285 | 10914377 | 10914520 | 10914534 |
| 10915070                                                                          | 10915140 | 10915236 | 10915529 | 10915544 | 10915574 | 10915588 | 10915930 |
| 10916058                                                                          | 10916197 | 10916233 | 10916407 | 10916439 | 10916557 | 10916606 | 10916901 |
| 10916914                                                                          | 10916932 | 10916985 | 10917050 | 10917113 | 10917385 | 10917604 | 10917610 |
| 10917682                                                                          | 10917872 | 10917873 | 10917925 | 10917960 | 10918361 | 10918364 | 10918428 |
| 10918492                                                                          | 10918495 | 10918533 | 10918580 | 10918606 | 10918861 | 10918866 | 10919092 |
| 10919116                                                                          | 10919328 | 10919476 | 10919566 | 10919635 | 10919703 | 10919827 | 10919838 |
| 10919961                                                                          | 10920068 | 10920094 | 10920131 | 10920143 | 10920196 | 10920242 | 10920271 |
| 10920378                                                                          | 10920414 | 10920651 | 10920805 | 10920902 | 10920971 | 10920993 | 10921077 |
| 10921191                                                                          | 10921322 | 10921560 | 10921914 | 10921941 | 10922149 | 10922196 | 10922212 |
| 10922290                                                                          | 10922431 | 10922446 | 10922718 | 10922744 | 10922806 | 10922848 | 10923264 |
| 10923312                                                                          | 10923484 | 10923489 | 10923668 | 10923681 | 10923781 | 10923806 | 10923872 |
| 10923904                                                                          | 10923934 | 10923960 | 10923979 | 10924001 | 10924026 | 10924065 | 10924124 |
| 10924405                                                                          | 10924419 | 10924748 | 10924789 | 10924902 | 10925116 | 10925194 | 10925201 |
| 10925519                                                                          | 10925846 | 10925852 | 10925882 | 10926233 | 10926261 | 10926465 | 10926503 |
| 10926540                                                                          | 10926582 | 10926778 | 10926833 | 10927309 | 10927323 | 10927398 | 10927550 |
| 10927600                                                                          | 10927670 | 10927750 | 10927807 | 10927907 | 10928049 | 10928177 | 10928211 |
| 10928368                                                                          | 10928377 | 10928416 | 10928763 | 10928808 | 10929394 | 10929415 | 10929439 |
| 10929949                                                                          | 10929970 | 10929973 | 10930159 | 10930354 | 10930444 | 10930648 | 10930658 |
| 10931015                                                                          | 10931101 | 10931220 | 10931481 | 10931610 | 10931701 | 10931709 | 10931919 |
| 10931930                                                                          | 10932082 | 10932655 | 10932719 | 10932748 | 10932769 | 10932889 | 10933053 |
| 10933121                                                                          | 10933131 | 10933344 | 10933527 | 10933567 | 10933834 | 10934477 | 10934516 |
| 10934667                                                                          | 10935161 | 10935251 | 10935503 | 10935615 | 10935751 | 10936248 | 10936424 |
| 10936948                                                                          | 10937202 | 10937206 | 10937244 | 10937359 | 10937371 | 10937539 | 10937637 |

| Customer Service Request Numbers Resolved in the Quartus II Software Version 13.0 |          |          |          |          |          |          |          |
|-----------------------------------------------------------------------------------|----------|----------|----------|----------|----------|----------|----------|
| 10939250                                                                          | 10939448 | 10939574 | 10940752 | 10940753 | 10941962 | 10943076 | 10943791 |
| 10943875                                                                          | —        | —        | —        | —        | —        | —        | —        |

## Software Patches Included in this Release

The Quartus II software version 13.0 includes the following patches released for previous versions of the Quartus II software:

| Quartus II Software Version | Patch  | Customer Service Request Number | Quartus II Software Version | Patch   | Customer Service Request Number |
|-----------------------------|--------|---------------------------------|-----------------------------|---------|---------------------------------|
| 13.0cb                      | 0.01b  | 10923349                        | 12.1                        | 0.dp5h  | 10916932                        |
| 12.1sp1                     | 1.dp6j | 10916932                        | 12.1                        | 0.dp5a  | 10900645                        |
| 12.1sp1                     | 1.dp6f | 10929908                        | 12.1                        | 0.dp3a  | 10870694                        |
| 12.1sp1                     | 1.dp6e | —                               | 12.1                        | 0.40    | 10908723                        |
| 12.1sp1                     | 1.dp6b | 10887004                        | 12.1                        | 0.39    | 10936047                        |
| 12.1sp1                     | 1.dp6a | —                               | 12.1                        | 0.38    | 10917934                        |
| 12.1sp1                     | 1.dp5a | —                               | 12.1                        | 0.36    | 10914063                        |
| 12.1sp1                     | 1.48   | 10935046                        | 12.1                        | 0.35    | 10928368                        |
| 12.1sp1                     | 1.47   | 10921445                        | 12.1                        | 0.33    | 10923934                        |
| 12.1sp1                     | 1.38   | 10924124                        | 12.1                        | 0.32    | 10913975                        |
| 12.1sp1                     | 1.36   | —                               | 12.1                        | 0.29    | 10917604                        |
| 12.1sp1                     | 1.34   | 10934334                        | 12.1                        | 0.27    | 10915930                        |
| 12.1sp1                     | 1.33   | 10929519                        | 12.1                        | 0.25    | 10914719                        |
| 12.1sp1                     | 1.30   | 10930576                        | 12.1                        | 0.24    | 10907784                        |
| 12.1sp1                     | 1.28   | —                               | 12.1                        | 0.14    | 10907784                        |
| 12.1sp1                     | 1.27   | 10928808                        | 12.1                        | 0.13    | 10886490                        |
| 12.1sp1                     | 1.25   | 10903692                        | 12.1                        | 0.12    | 10888014                        |
| 12.1sp1                     | 1.23   | 10931343                        | 12.1                        | 0.10    | 10907784                        |
| 12.1sp1                     | 1.19   | —                               | 12.0sp2                     | 2.dp9c  | 10896162                        |
| 12.1sp1                     | 1.15   | 10921167                        | 12.0sp2                     | 2.dp9b  | 10896162                        |
| 12.1sp1                     | 1.14   | 10913975                        | 12.0sp2                     | 2.dp10j | —                               |
| 12.1sp1                     | 1.11   | 10917940                        | 12.0sp2                     | 2.47    | 10924124                        |
| 12.1sp1                     | 1.08   | 10919703                        | 12.0sp2                     | 2.46    | 10914192                        |
| 12.1sp1                     | 1.05   | 10904882                        | 12.0sp2                     | 2.04    | 10870890                        |

| Quartus II Software Version | Patch | Customer Service Request Number | Quartus II Software Version | Patch | Customer Service Request Number |
|-----------------------------|-------|---------------------------------|-----------------------------|-------|---------------------------------|
| 12.1sp1                     | 1.03  | —                               | 12.0sp2                     | 1.14  | 10870890                        |
| 12.1sp1                     | 1.01  | —                               | 10.1sp1                     | 1.112 | 10913975                        |

## Latest Known Quartus II Software Issues

For more information about known software issues, look for information on the **Quartus II Software Support** page at the following URL:

<http://www.altera.com/support/software/sof-quartus.html>

You can find known issue information for previous versions of the Quartus II software on the Knowledge Database page at the following URL:

<http://www.altera.com/support/kdb/kdb-index.jsp>

## Document Revision History

The following table shows the revision history for this document.

### Document Revision History

| Date     | Version | Changes         |
|----------|---------|-----------------|
| May 2013 | 13.0.0  | Initial release |