Lattice Diamond Software 3.13 Release Notes

Welcome to Lattice Diamond® software, the complete design environment for Lattice Semiconductor Field Programmable Gate Arrays (FPGAs).

What's New in Diamond Software 3.13

- **Device Support:**
  - MachXO2™ (LAMXO2)
    - 256HC (-5) 2.5V/3.3V (AUTO) – CSBGA132, TQFP100
    - 640HC (-5) 2.5V/3.3V (AUTO) – CSBGA132, TQFP100
  - MachXO3LF™
    - LAMXO3LF (Auto Devices)
      - 640E (-5) 1.2V (AUTO) – CSBGA132, TQFP100
      - 1300C (-5) 2.5V/3.3V (AUTO) – CSBGA132, TQFP100
      - 1300E (-5) 1.2V (AUTO) – CSBGA132, TQFP100
      - 2100C (-5) 2.5V/3.3V (AUTO) – CSBGA132, TQFP100
      - 2100E (-5) 1.2V (AUTO) – CSBGA132, TQFP100
      - 4300C (-5) 2.5V/3.3V (AUTO) – CSBGA132
      - 4300E (-5) 1.2V (AUTO) – CSBGA132
    - LCMXO3LF (Commercial/Industrial Devices)
      - 640E (-5/-6) 1.2V (COM/IND) – CSBGA132, TQFP100
      - 1300C (-5/-6) 2.5V/3.3V (COM/IND) – CSBGA132, TQFP100
      - 1300E (-5/-6) 1.2V (COM/IND) – CSBGA132, TQFP100
      - 2100C (-5/-6) 2.5V/3.3V (COM/IND) – CSBGA132, TQFP100
      - 2100E (-5/-6) 1.2V (COM/IND) – CSBGA132, TQFP100
      - 4300C (-5/-6) 2.5V/3.3V (COM/IND) – CSBGA132
      - 4300E (-5/-6) 1.2V (COM/IND) – CSBGA132

- **Tool and Other Enhancements:**
  - **Platform Designer** – Global Export option has been added to support ASC devices with MachXO3D.
  - **Programmer** – The I2C TransFR feature is now available for the MachXO3LF device.
  - **Strategies** – The Low Skew Clock Net strategy option has been added to Place & Route Design for the ECP5 device.
  - **Reveal Analyzer** – Cable Connection Manager and Token Set Manager options have been added to the Reveal Analyzer toolbar.

Support for Third-Party Synthesis and Simulator Tools

The Synopsys Synplify Pro® for Lattice synthesis tool and the Siemens ModelSim Lattice Edition simulator tool are included in the Diamond software.

- **Synopsys Synplify Pro FPGA synthesis software version U-2023.03L-SP1**
  - Release Notes for Synplify Pro are located in ..\<*install_directory*>\diamond\3.13\synpbase\doc\. The file name is release_notes.pdf.
  - A full set of documents for Synplify Pro are also located in ..\<*install_directory*>\diamond\3.13\synpbase\doc\.
- **Siemens ModelSim Lattice Edition 2023.3 revision 2023.07**
  - Release Notes for ModelSim Lattice Edition are located in ..\<*install_directory*>\diamond\3.13\modeltech\. The file names are RELEASE_NOTES.html or RELEASE_NOTES.txt.
  - A full set of documents for ModelSim Lattice Edition are located in ..\<*install_directory*>\diamond\3.13\modeltech\doc\.
- **Siemens Questa® 2020.4**

Supported Devices

Lattice Diamond can be used with either a free license or a subscription license. The two licenses provide access to different device families.

Device Family	Free License	Subscription License
ASC	◄	◄
ECP5U	◄	◄

Device Family	Free License	Subscription License
ECP5UM™		◀
ECP5UM5G™		◀
LatticeEC™	◀	◀
LatticeECP™	◀	◀
LatticeECP2™	◀	◀
LatticeECP2M™		◀
LatticeECP2S™		◀
LatticeECP2MS™		◀
LatticeECP3™		◀
LatticeSC™		◀
LatticeSCM™		◀
LatticeXP™	◀	◀
LatticeXP2™	◀	◀
LFMNX (Mach-NX)	License-controlled. Contact Lattice Technical Support.	
LIFMD (CrossLink)	◀	◀
LIFMDF (CrossLinkPlus)	◀	◀
MachXO™	◀	◀
MachXO2	◀	◀

Device Family	Free License	Subscription License
MachXO3D™	◀	◀
MachXO3L™	◀	◀
MachXO3LF	◀	◀
Platform Manager™	◀	◀
Platform Manager 2™	◀	◀

System Requirements

The basic system requirements for Lattice Diamond are:

- Intel Pentium or Pentium-compatible PC, or AMD Opteron system support (Linux only)
- One of the following operating systems:
  - Windows 10/11 (64-bit)
  - Red Hat Enterprise Linux 8.8/7.9. The host operating system is supported in 64-bit only.
  - CentOS 8.4/7.9
- Approximately 5.75 GB free disk space
- RAM adequate for your FPGA design. For guidelines, see Memory Requirements.
- Network adapter and, for a floating license, network connectivity

  A node-locked license is based on the physical (hard-coded) address provided by the network adapter. Network connectivity is not required for a node-locked license. In the absence of a network connection, you can install the NWLink IPX/SPX protocol to force recognition of your NIC card ID (see the Installation Notice).

  A floating license requires access to the license server, so both a network adapter and connectivity are required.
- JavaScript-capable Web browser

Memory Requirements

The following table lists the minimum memory requirements (64-bit software) and the recommended memory for the Lattice Semiconductor devices supported by Diamond.

Designing for LatticeECP3 with more than 95K LUT on a Windows system requires a 64-bit operating system.

Table 1 Recommended Memory

Device	Size	Minimum	Recommended
ECP5U/UM/UM5G	*All*	*4 GB*	*6 GB*
LatticeEC, LatticeECP	Up to 20K LUT	1 GB	1.5 GB
	Up to 50K LUT	1.5 GB	2 GB
LatticeECP2/M	Up to 20K LUT	1.5 GB	2 GB
	Up to 50K LUT	2 GB	3 GB
	Up to 100K LUT	2 GB	4 GB
LatticeECP3	Up to 95K LUT	4 GB	6 GB
	Up to 150K LUT	6 GB	8 GB
LatticeSC/M	Up to 40K LUT	1.5 GB	2 GB
	Up to 115K LUT	2 GB	5 GB
LatticeXP, LatticeXP2	Up to 20K LUT	1 GB	1.5 GB
	Up to 50K LUT	1.5 GB	2 GB

Device	Size	Minimum	Recommended
MachXO, MachXO2, MachXO3D, MachXO3L, Mach-NX	All	512 MB	1 GB
LIFMD (CrossLink), LIFMDF (CrossLinkPlus)	All	512 MB	1 GB
Platform Manager, Platform Manager 2	All	512 MB	1 GB

Extending Memory on Windows

Note that increasing the amount of memory available to applications decreases the amount available for the file cache, paged pool, and nonpaged pool, which can affect applications with heavy networking or I/O.

Use the `BCDEdit /set increaseuserva 3072` command to set the boot entry option to 3 GB. For details, see Microsoft article “BCDEdit /set”: msdn.microsoft.com/en-us/library/ff542202.aspx

- When installing the Red Hat Enterprise Linux version, be sure to install the PERL modules XML::Parser, XML::DOM, and XML::RegExp. These PERL modules are available at www.cpan.org.

Issues Fixed

The following known issues are fixed in this release. Their workarounds are no longer needed.

Incorrect FSM state in simulation with synthesis using LSE. This is due to an issue with the unreachable state process of FSM with synchronous reset’s design.

Devices affected: All devices

Bug number: SOF-131286, SOF-131857

Fixed in Diamond 3.13

PLL CLKI frequency range in IP GUI does not match the datasheet.

Devices affected: ECP5 and ECP5-5G

Bug number: SOF-131154

Fixed in Diamond 3.13

The set_input_delay -min constraint is not reflected on Spreadsheet View and Timing Analysis View.

Devices affected: All devices

Bug number: SOF-131219

Fixed in Diamond 3.13

Records bus type in VHDL are not displayed properly in Synplify Pro's Hierarchical View.

Devices affected: All devices

Bug number: SOF-131258

Fixed in Diamond 3.13

Post MAP and PAR simulation on inferred Distributed RAM using LSE has incorrect Read Data value.

Devices affected: All devices

Bug number: SOF-131672

Fixed in Diamond 3.13

Synthesis with Synplify Pro failed with the following error message: "@E::Signal 011 error in m_gen_lattice.exe."

Devices affected: All devices

Bug number: SOF-131581

Fixed in Diamond 3.13

MachXO3D SSPI pins with IO_TYPE = LVCMOS12 are not working in user mode.

Devices affected: MachXO3D

Bug number: SOF-131419

Fixed in Diamond 3.13

Synthesis failed when Synplify Pro is used on Intel 11th generation and newer processors.

Devices affected: All devices

Bug number: SOF-131206

Fixed in Diamond 3.13

Incorrect simulation results are observed when a memory is initialized using the ECO editor.

Devices affected: ECP5U, ECP5UM, ECP5UM5G

Bug number: SOF-131079

Fixed in Diamond 3.13

There is a segmentation fault issue when starting Diamond in a VM environment without USB Controller enabled.

Devices affected: MachXO3D

Bug number: SOF-131155

Fixed in Diamond 3.13.

Compilation errors out when using Reveal due to an issue with enumerated VHDL type and VHDL integer type.

Devices affected: MachXO3LF

Bug number: SOF-131242

Fixed in Diamond 3.13

Reveal Analyzer token sets display no values for undefined states.

Devices affected: All devices

Bug number: SOF-131326

Fixed in Diamond 3.13

Platform Designer cannot parse designs with different VHDL library name.

Devices affected: MachXO3LF

Bug number: SOF-131404

Fixed in Diamond 3.13

VDHL library dependency issue causing synthesis to fail when Reveal is inserted.

Devices affected: ECP5U

Bug number: SOF-131441

Fixed in Diamond 3.13

LSE may error out when maximum name length is exceeded.

Devices affected: MachXO2

Bug number: SOF-131122

Fixed in Diamond 3.13

Power Calculator's "ASCVCC 3.6V" voltage value is unclear.

Devices affected: Platform Manager

Bug number: SOF-131545

Fixed in Diamond 3.13

The "Ignore Preference Error" strategy option under MAP strategy setting is not working.

Devices affected: MachXO3LF

Bug number: SOF-131566

Fixed in Diamond 3.13

Reveal generates wrong file with in-line synthesis attributes when specifying the IO types.

Devices affected: MachXO3LF

Bug number: SOF-130778

Fixed in Diamond 3.13

Physical Path Details Calculation adds an invalid path and affects timing.

Devices affected: MachXO3LF

Bug number: SOF-131460

Fixed in Diamond 3.13

The -Os optimization level is missing from the LatticeMico System.

Devices affected: All devices

Bug number: SOF-131679

Fixed in Diamond 3.13

MAP may error out when assigning ports to SPI_QUAD pins.

Devices affected: ECP5U

Bug number: SOF-131661

Fixed in Diamond 3.13

If your target device is LFMNX, the device selector shows incorrect PIO count.

Devices affected: LFMNX

Bug number: SOF-130616

Fixed in Diamond 3.13

Known Issues for Diamond 3.13

The following are known issues for the Diamond Software 3.13.

If you launch ./debugger on Linux, you may encounter the following issue: “Segmentation Fault (core dumped).”

Workaround: Launch Download Debugger on Windows.

Devices affected: All devices

Bug number: SOF-131817

In Spreadsheet View, the Trace Length option is not available when exporting pin layout files for CABGA256 packages.

For assistance with the issue, please contact Lattice Technical Support.

Devices affected: ECP5U-12, ECP5U-25, ECP5U-45

Bug number: SOF-131800, SOF-131504

If your target device is LFMNX, there may be a PIO count mismatch between Device Selector and MAP and PAR Report.

For assistance with the issue, please contact Lattice Technical Support.

Devices affected: LFMNX

Bug number: SOF-130990

Contacting Technical Support

FAQs
The Answer Database on the Lattice Semiconductor website provides solutions to questions that many of our customers have already asked. Lattice Applications Engineers are continuously adding content to the Database.

Technical Support Assistance
Submit a technical support case via www.latticesemi.com/techsupport.

For Local Support
Contact your nearest Lattice Sales Office.