LeonardoSpectrum
Release Notes

Software Release v2002a

March 2002

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Release v2002a

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Product Enhancements

Altera LogicLock Methodology is Now Supported

LogicLock™ incremental design is a new methodology available exclusively to Quartus® II users. Using the LogicLock methodology, each module in a design is implemented independently. LeonardoSpectrum supports this methodology by allowing you to assign a LOGICLOCK attribute to one or more modules using the Module PowerTab of the Constraints FlowTab. This attribute is passed to Quartus II through a Tcl file that tells Quartus II to implement the module in a particular area of the chip.

Xilinx Support

- Virtex-II and Virtex-II Pro MULT18X18S pipeline multiplier support has been added

  Virtex-II devices have synchronous multiplier cells (MULT 18X18S) with built-in register banks for the outputs. These cells are useful for implementing very fast pipelined multipliers. With this release, LeonardoSpectrum uses this cell to build pipeline multipliers with a large number of stages. For pipeline designs with less than two stages, the regular MULT18X18 cell is used which is generally more efficient for this type of design.

- Virtex-II SRL dynamic mode is now supported

- Virtex-II RAM inferencing has been improved

New Technologies

The following devices are now supported.

New Actel Devices

ProASICPLUS

LeonardoSpectrum now supports Actel's newest technology ProASICPLUS. The library name is listed as PA in the Actel technology list.

Other Devices Supported

RT54SX Family	
Default Speed Grade: -1	
Speed Grades supported: -1, STD	
New Devices Supported	
RT54SX72	CQFP208, CQFP256

RT54SXS Family	
Default Speed Grade: -1	
Speed Grades supported: -1, STD	
New Devices Supported	
RT54SX72S	CQFP208, CQFP256

New Altera Devices

Stratix Device Support

The new Stratix architecture features eight times more RAM bits as well as dedicated DSP functionality, on-chip termination resistors and advanced system clock management features. LeonardoSpectrum now supports the following Stratix devices.

Stratix Devices	
EP1S10	F780C
EP1S20	F780C
EP1S25	F780C, F1020C
EP1S30	B956C, F1020C
EP1S40	B956C, F1020C, F1508C
EP1S60	B956C, F1020C, F1508C
EP1S80	B956C, F1508C

Stratix Speed Grades
Default Speed Grade: 5
Speed Grades supported: 5, 6, 7

Stratix Wire Load	
stratix_default	stratix_bc
stratix_wc	stratix_megalab_default

New Lattice Devices

- MACH Devices

MACH Devices	
MACH4A	M4A3: 384/160, 512/160, 512/192, 512/256
Packages	44PLcc 44TQFP 48TQFP 100TQFP 144TQFP 208PQFP

- ispMACH 5000MX CPLD

- ispGDX2 Crossbar Switch

New QuickLogic Devices

Eclipse Devices Supported	
QL6250	PT280 PS484 PB516 PS672
QL6325	PT280 PS484 PB516 PS672
QL6500	PT280 PS484 PB516 PS672
QL6500	PT280 PS484 PB516 PS672
QL6600	PT280 PS484 PB516 PS672
Process	Typical Case (default), Best Case, Worst Case

QuickDSP	
Devices Supported	
QL7100	PT280 PS484 PB516 PS672
QL7120	PT280 PS484 PB516 PS672
QL7160	PT280 PS484 PB516 PS672
QL7180	PT280 PS484 PB516 PS672
Process	Typical Case (default), Best Case, Worst Case

QuickPCI	
Default Speed Grade: -1	
Speed Grades supported: 0, -1, -2, -3, -4	
Devices Supported	
QL5030	PF144 CF208 PQ208 PB256 PB456 BG484
QL5130	PF144 CF208 PQ208 PB256 PB456 BG484
QL5032	PF144 CF208 PQ208 PB256 PB456 BG484
QL5232	PF144 CF208 PQ208 PB256 PB456 BG484
QL5064	PF144 CF208 PQ208 PB256 PB456 BG484
Process	Typical Case (default), Best Case, Worst Case

QuickRAM	
Default Speed Grade: -1	
Speed Grades supported: 0, -1, -2, -3, -4	
Devices Supported	
QL4009	CF208 PB256 PB456 PF100 PF144 PQ208 PQ240
QL4016	CF208 PB256 PB456 PF100 PF144 PQ208 PQ240
QL4036	CF208 PB256 PB456 PF100 PF144 PQ208 PQ240
QL4058	CF208 PB256 PB456 PF100 PF144 PQ208 PQ240
QL4090	CF208 PB256 PB456 PF100 PF144 PQ208 PQ240
Process	Typical Case (default), Best Case, Worst Case

New Xilinx SPARTAN-IIE Devices Supported

Spartan-IIE Devices Supported	
Internal Library Name: xis2e	
2s50e	ft256, pq208, tq144
2s100e	ft256, fg456, pq208, tq144
2s150e	ft256, fg456, pq208
2s200e	fg256, fg456, pq208
2s300e	fg256, fg456, pq208

Spartan-IIE Speed Grades
Default Speed Grade: -7
Speed Grades supported: -6, -7

Spartan-IIE Wire Load Tables	
xis2e50-6_wc	xis2e50-7_wc
xis2e100-6_wc	xis2e100-7_wc
xis2e150-6_wc	xis2e150-7_wc
xis2e100-6_wc	xis2e100-7_wc
xis2e200-6_wc	xis2e200-7_wc
xis2e300-6_wc	xis2e300-7_wc

New Xilinx VIRTEX-II Pro Devices Supported

VIRTEX-II Pro Devices Supported	
Internal Library Name: xcv2p	
2VP2	fg256, fg456
2VP4	fg256, fg456
2VP7	fg456, bg575
2VP20	bg575, ff1152
2VP50	ff1152

VIRTEX-II Pro Speed Grades	
Default Speed Grade: -7	
Speed Grades supported: -6, -7	

VIRTEX-II Pro Wire Load Tables	
xcv2p-2-7_wc	xcv2p-2-6_wc
xcv2p-4-7_wc	xcv2p-4-6_wc
xcv2p-7-7_wc	xcv2p-7--6_wc
xcv2p-20-7_wc	xcv2p-20-6_wc
xcv2p-50-7_wc	xcv2p-50-6_wc

New CoolRunner-II Devices

CoolRunner-II	
Default Speed Grade: -7	
Speed Grades supported: -4, -5, -7, -10	
Devices Supported	
X2C32	PC44, VQ44, CP56
X2C64	PC44, VQ44, CP56, VQ100, CP132
X2C128	VQ100, CP132, TQ144, FT256
X2C256	VQ100, CP132, TQ144, VQ100, FT256

Fixed Bugs

DR296844 LeonardoSpectrum places a buf on the wrong wire when an inout port is joined to a net with another port.

DR297760 LeonardoSpectrum failed to issue a warning or an error when it found a missing or repeated port in the HDL source.

DR300196 LeonardoSpectrum abnormally terminates while synthesizing a customer design.

DR301435 Spectrum incorrectly reports that a design won't fit in a Xilinx Coolrunner device.

DR301484 Unable to change process (speed) variable from the LeonardoSpectrum GUI

DR302148 LeonardoSpectrum incorrectly reports an error when parsing an else'0' clause without a space.

DR302346 LeonardoSpectrum generates misleading messages while inferring a counter.

DR302347 LeonardoSpectrum abnormally terminates while synthesizing a customer design.

DR303026 LeonardoSpectrum output causes an error in Max+Plus II.

DR303456 Optimization for Altera technology producing overly complicated logic.

DR303551 Not possible to read a constraint file from the Input FlowTab.

DR303554 In a Xilinx CoolRunner design, macrocells are in- correctly used instead of gates.

DR303630 LeonardoSpectrum uses incorrect speed grade nomenclature for Altera Mercury.

DR304128 Parameter which is not a constant causes LeonardoSpectrum to abnormally terminate.

DR304178 exclude_gates variable has no effect on the APEX20 Family.

DR304678 Design appears to compile correctly but can't be read into LeonardoSpectrum.

DR304963 do_ip command does not do boundary optimization.

DR304976 STARTUP_VIRTEX2 block gets optimized away.

DR305276 LeonardoSpectrum accepts bad port assignments on customer design

DR305648 Insertion of a BUFG in a special case circuit creates an illegal logic structure.

DR305721 LeonardoSpectrum error tracing mechanism fails if the source line number is greater than 16 bits.

DR305848 Constraint file is lost after a READ command is executed.

DR305984 Actel PRO ASIC flow abnormally terminates on demo design.

DR306021 Wrong logic produced due to inverted clock for CoreGen BlockRAM.

DR306445 (DR310128) LeonardoSpectrum fails to complete boundary optimization on customer design.

DR306768 Customer design causes LeonardoSpectrum to terminate prematurely.

DR307208 Unable to modify Editor preferences.

DR307244 Verilog file created by HDL Designer causes LeonardoSpectrum to crash.

DR307961 Internal signal clock buffer cells exceed Actel 42MX library limit.

DR308008 LeonardoSpectrum with the Actel A500k technology selected abnormally terminates while writing EDIF.

DR309018 LeonardoSpectrum GUI crashes when writing EDIF for Actel A500K.

DR309597 VHDL file with the same functionality but different coding style produces different sized circuits.

DR309597 Request to add Altera LogicLock support to the LeonardoSpectrum GUI.

DR310113 LeonardoSpectrum generates an incorrect multiple-drivers error message on a customer design.

DR310131 (DR310297) LeonardoSpectrum incorrectly optimizes the neq operator in a customer design.

DR310619 LeonardoSpectrum incorrectly infers RAM in customer's Virtex-E design.

DR311656 LeonardoSpectrum incorrectly maps the output ports of a RAM16X1D cell on Solaris.

DR312749 LeonardoSpectrum abnormally terminates on a custom ASIC library with no INV cell.

DR315362 LeonardoSpectrum produces clock enable logic that is too complex.

Unix O/S Patch Details

Starting with Release 2001.1d, LeonardoSpectrum supports MainWin 3.4 software running on the Solaris 7/8 and HP-UX 10.20/11.00 operating systems. MainWin 3.4 requires certain patches in order to run properly. You may install operating system patches before or after you install LeonardoSpectrum. The paragraphs that follow outline the required patches for each operating system.

Sun Microsystems Patches

Detecting the Graphics Card

On Solaris systems, a patch is sometimes required that is specific for the installed graphics card. Use the instructions that follow to determine which graphics card is installed on your system.

To verify that an FFB accelerator is installed on the system (Creator 3D), enter

```
% dmesg | grep ffb
```

The output should be:

```
SUNW,ffb0 at root: UPA 0x1e 0x0
SUNW,ffb0 is /SUNW,ffb@1e,0
stdout is (/SUNW,ffb@1e,0) major (53) minor (0)
```

To verify that an AFB accelerator is installed on the system (Elite 3D), enter

```
% dmesg | grep afb
```

The output should be:

```
SUNW,afb0 at root: UPA 0x1e 0x0
SUNW,afb0 is /SUNW,afb@1e,0
```

```
stdout is major <79> minor <0>
```

To detect graphics cards (alternate method), enter

```
% ls /dev/fbs/*
```

You can tell which graphic card is present by the output from the command; refer to Table 0-1.

Table 0-1. Detecting a Graphics Card

Output	Graphics Card
/dev/fbs/m640	PGX graphics card
/dev/fbs/afb*	Elite3D graphics card
/dev/fbs/ffb*	Creator/Creator3D graphics card
/dev/fbs/gfxp*	PGX32 (Raptor GFX) graphics card
/dev/fbs/cgsix*	GX graphics card
/dev/fbs/leo*	ZX graphics card
/dev/fbs/sx*	SX graphics card
/dev/fbs/tcx*	TCX graphics card

Solaris 8 Patches

The following tables describe the required patches for Solaris 8 operating systems. Patches are available for download at the following Sun web site: http://sunsolve.sun.com

Table 0-2. Patches for All Solaris 8 systems

Patch	Description	Notes
108434-01	Shared library fix for C++ run-time.	Shared library fix for C++ run-time.

Solaris 7 Patches

The following tables describe the required patches for Solaris 7 operating systems. Patches are available for download at the following Sun web site: http://sunsolve.sun.com

Table 0-3. Patches for All Solaris 7 systems

Patch	Description	Notes
106300-07	Sun OS 5.7 Shared library patch for C++.	Required for Mentor Graphics D.2 environment.
106327-06	Sun OS 5.7 Shared library patch for C++.	Required for Mentor Graphics D.2 environment.
106725-02		Required for Mentor Graphics D.2 environment.
106748-04		Required for Mentor Graphics D.2 environment.
107200-11		Required for Mentor Graphics D.2 environment.
12/8/99 Recommended Patch Cluster		Required for Mentor Graphics D.2 environment.

Table 0-4. Configuration-Specific Patches for Solaris 7 systems

Patch	Description	Notes
107851-11 (or later)	Patch for PGX32 (Raptor GFX) graphics card	PGX32 2.1 graphics patch
106146-16 (or later)	M64 graphics card	For PGX (M64 graphics card)
106145-17 (or later)	Creator 7 FFB graphics card	Patch for Creator graphics card
106144-21 (or later)	Elite3D graphics card	For Elite3D AFB graphics patch
106147-06 (or later)	Supplemental patch for Elite 3D and Creator graphics cards	VIS/XIL graphics patch

106148-12 (or later)	Required supplemental patch for Elite 3D and Creator graphics cards	XF8 graphics patch

HP-UX 10.20 and HP-UX 11.00 Patches

The following patches are required on the HP-UX 10.20 and HP-UX 11.00 operating system to allow LeonardoSpectrum with MainWin 3.4 to run appropriately.

Patches are available on the following HP WEB sites:

http://us-support.external.hp.com
http://europe-support.external.hp.com

Table 0-5. Patches for All HP-UX 10.20 systems

Patch	Description	Notes
PHSS_19739	s700_800 10.20 HP DCE/9000 1.5 cumulative patch	Fixes problems with threads.
PHCO_19434	s700_800 10.20 csh(1) cumulative patch	Fixes crash of csh exit of Mainwin.
PHSS_17872	HP aC++ runtime libraries (ACC A.01.21)	
PHSS_17159	s700_800 10.20 Xserver cumulative patch	Fixes X server crach with multiple-rectangle

Table 0-6. Patches for All HP-UX 11.00 systems

Patch	Description	Notes
PHSS_19866	s700_800 11.00 X/Motif2.1 Dev Kit Mar99 Periodic Patch	X patch.
PHSS_17327	s700_800 11.00 ld(1) and linker tools cumulative patch	Linker patch.

Known Problems

Internet Explorer 5.0 is Required for Windows NT

If you plan to run the LeonardoSpectrum GUI on the Windows NT Operating System, you must install Internet Explorer 5.0 or higher.

Opening Files on Windows 2000

The LeonardoSpectrum Open Files dialog box opens starting with the current working directory. On Windows 2000, the Open Files dialog box may open on the directory where the last file was opened, even if that file was opened by another application. The Windows 2000 operating system has been identified as the source of the problem and a bug report has been submitted to Microsoft.

Designs with Long Chains of Arithmetic Operators May Experience Long Run Times

If your design contains a long chain of arithmetic operators, you may experience a long optimization run time. The workaround to this problem is to turn off Optimization Pass 4.