

MegaCore Functions

Altera Megafunctions for High-Density Design

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Megafunction Solution to Fit Your Design Needs

With programmable logic device (PLD) densities reaching 250,000 gates, your design flows must be as efficient and productive as possible. Altera provides ready-made, pre-tested, and optimized megafunctions—called MegaCore™ functions—that allow you to rapidly implement the functions you need, instead of building them from the ground up. MegaCore functions reduce your design task to creating only the custom logic surrounding these architectural blocks. You can then focus on high-level design and spend more time and energy on improving and differentiating your product.

Altera MegaCore functions offer a total solution for using megafunctions in your designs.

Risk-Free Evaluation with Altera OpenCore Feature

Before choosing and licensing a MegaCore function, you want to be sure that it meets your function and performance requirements. You can evaluate Altera MegaCore functions before



committing to a purchase by using the Altera OpenCore™ evaluation feature, available with the MAX+PLUS® II software.

You can instantiate a MegaCore function in your design, compile and simulate the design, and verify the MegaCore function's size and performance. Based on the result of this evaluation, you can make an informed decision on whether to license the MegaCore function. Once you license a MegaCore function, the MAX+PLUS II software will give you access to programming files, as well as EDIF, VHDL, or Verilog HDL netlist files for simulation in third-party EDA tools. Figure 1 shows a typical design flow using MegaCore functions.

Download Free MegaCore Functions

You can download MegaCore functions for OpenCore evaluation from the Altera world-wide web site at <http://www.altera.com>.

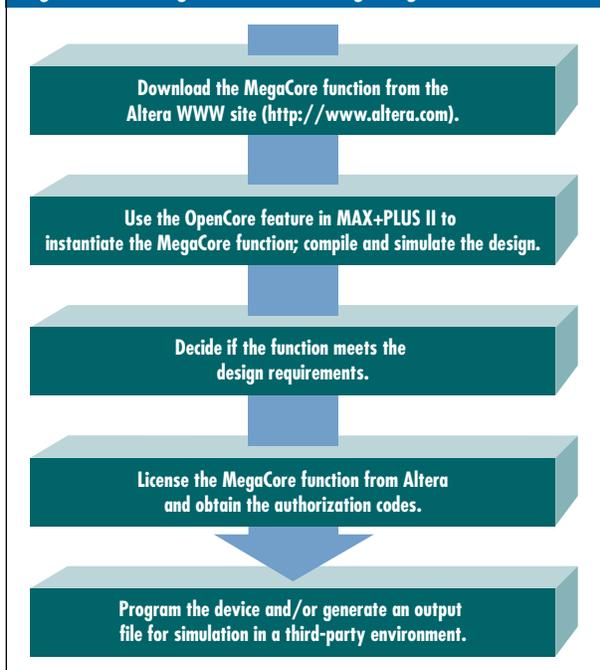
Unmatched Design Tools Performance

The easy-to-use MegaCore functions are supported by the MAX+PLUS II development system, long recognized as the best design tool in the PLD industry, offering unmatched flexibility and performance. With the MAX+PLUS II software, you can quickly implement and test changes to your design, program Altera PLDs at your desktop, and take full advantage of the time-to-market benefits offered by MegaCore functions.

Parameterization with MegaWizard Plug-In Manager

Your design projects may require the ability to customize megafunctions in order to optimize performance and device utilization or to specify required features. Many MegaCore functions can be parameterized to suit your particular design needs. You can rapidly optimize your design by adjusting the parameters of your MegaCore function in the MAX+PLUS II design environment. Simply enter the parameter values directly into your design file or the dialog box or use the MegaWizard™ Plug-In Manager. MAX+PLUS II automatically interprets the parameters and creates the desired functionality.

Figure 1. Design Flow for Using MegaCore Functions



Simple Verification

After you incorporate a MegaCore function into a design, you need the ability to verify the result through simulation. All Altera MegaCore functions include test vectors. In addition, the PCI MegaCore functions include the PCI Prototype Board and software driver for hardware verification.

Simple Licensing

Altera MegaCore functions are easy to license because they are sold as MAX+PLUS II migration products. Once you license a MegaCore function, you can use it on an unlimited number of projects and devices without expiration. You will save valuable time from reviewing lengthy licensing agreements or worrying about licensing restrictions.

MegaCore Functions for Maximum Versatility

Altera MegaCore products offer the functions you need today. They are focused on key PLD applications, including PCI interface, DSP, video, and communications.

PCI MegaCore Functions

Altera offers complete solutions to your PCI design needs. PLSM-PCI/A is a drop-in PCI master-target megafunction that offers zero-wait state burst mode transfer at 33 MHz. It incorporates a direct memory access (DMA) control engine and a complete back-end interface. You can simply instantiate this function in your design file, attach your back-end circuit, and rapidly implement a PCI design in a single PLD. Altera PCI MegaCore functions include the PCI Prototype Board and test vectors that enable you to verify your design with hardware. Their software driver makes it possible to immediately test your design.

PLSM-PCIT1 is a high-performance, efficient solution for target-only applications. It supports the zero-wait state burst mode transfer of unlimited length at 33 MHz and is hardware-tested in real PCI systems. All major features are parameterized, including the base address register space.

Altera MegaCore Functions		
APPLICATIONS	ORDERING CODE	FUNCTION
PCI Master-Target Interface	PLSM-PCI/A	PCI master-target interface with internal DMA engine and zero-wait state burst mode operation at 33 MHz
PCI Target Interface	PLSM-PCIT1	PCI target interface with zero-wait state burst mode operation of unlimited length at 33 MHz
DSP/Fast Fourier Transform	PLSM-FFT	Fully parameterized fast Fourier transform function
Microperipheral Functions	PLSM-MICROLIB PLSM-8237 PLSM-8251 PLSM-8255 PLSM-6402 PLSM-16450 PLSM-6850 PLSM-8259	Library of UART, DMA controller, and parallel port controller functions Programmable DMA controller Programmable communications interface Programmable peripheral interface adapter Universal asynchronous receiver/transmitter Universal asynchronous receiver/transmitter Asynchronous communications interface adapter Programmable interrupt controller
Video/Color Space Converter	PLSM-CSC	RGB-to-YCrCb and YCrCb-to-RGB color space converters
Communications/Error Checking	PLSM-CRC	Fully parameterized cyclic redundancy code generator and checker

Microperipheral MegaCore Functions

Altera is committed to providing and expanding a Microperipheral MegaCore library of basic building blocks for high-density PLD design. The library includes UART, bus controller, DMA, and interrupt controller functions that have been extensively verified with the MAX+PLUS II development tool and in third-party design environments.

The Altera Microperipheral MegaCore functions can be licensed individually or as the PLSM-MICROLIB library.

Fast Fourier Transform (FFT) Function

The Altera FFT MegaCore function provides exceptional performance and parameterized flexibility. It also allows users to interface the fast Fourier transform function to internal memory blocks on a FLEX® 10K device or to external memory.

The FFT MegaCore function is ideal for DSP applications. It offers the flexibility critical to high-performance applications, such as RF-rate communication systems in cable and wireless networks and spread-spectrum direct-sequence modems.

Color Space Converter Functions

The color space converter MegaCore functions convert image data from the RGB color space, used for television broadcast signals, to the YCrCb color space, used for digital video, and vice-versa (YCrCb to RGB). The highly optimized design uses minimal logic and runs at video frame rates. These MegaCore functions are ideal as quick, inexpensive, efficient solutions for digital video and image-processing applications.

Cyclic Redundancy Code (CRC) Function

The Altera CRC MegaCore function offers unmatched flexibility in implementing the cyclic redundancy code generator and checker. Users can configure the CRC MegaCore function by defining its parameters to implement functions that comply with the CRC-32, CRC-16, CCITT, and other standards, or proprietary CRC error checking schemes. This function is ideal for data communication and networking solutions.

MegaCore Functions Provide the Design Flexibility You Need

Whether your design integrates standard products such as UARTs and interrupt controller functions or requires guaranteed PCI performance based on a proven, hardware-tested solution, Altera MegaCore functions will suit your specific high-density design needs. For the latest MegaCore literature and information, go to the Altera world-wide web site at <http://www.altera.com>.

Altera Offices

Altera Corporation
101 Innovation Drive
San Jose, CA 95134
Telephone: (408) 544-7000
<http://www.altera.com>

Altera European Headquarters
Holmers Farm Way
High Wycombe
Buckinghamshire
HP12 4XF
United Kingdom
Telephone: (44) 1 494 602 000

Altera Japan Ltd.
Shinjuku Mitsui Bldg. 36F
1-1, Nishi-Shinjuku, 2 Chome
Shinjuku-ku, Tokyo 163-0436
Japan
Telephone: (81) 3 3340 9480

Altera International Ltd.
Suites 908-920, Tower 1
MetroPlaza
223 Hing Fong Road
Kwai Fong, New Territories
Hong Kong
Telephone: (852) 2487 2030