APPLICATION NOTE

Programming of Atmel Programmable Logic Devices

Atmel SPLD/CPLD

Introduction

Atmel® Programmable Logic Devices (PLDs) are Electrically Erasable and Programmable Read-Only Memory (EEPROM) based devices which contains the configuration information for the configurable logic blocks, interconnects, and device options. Therefore, the EEPROM in the PLD needs to be properly programmed with a JEDEC fusemap file (.JED) in order for the PLD to operate as intended. For the Atmel ATF15xx CPLDs with the programmable JTAG feature, In-System Programming (ISP) is possible; therefore, they can be programmed using stand-alone programmers before they are mounted on the PCB or in-system programmers after they are mounted. For all other Atmel PLDs, in-system programming is not supported and must be programmed using stand-alone programmers before they are mounted on the PCB.

Features

- Atmel Programming Tools
- Third-party Programming Tools
- Third-party Programming Services
- In-circuit Testing

1 Atmel Development Programming Tools

For the ATF15xx CPLDs with JTAG ISP support, Atmel offers the ATF15xx-DK3-U Development/Programmer Kit, the ATDH1150USB USB-based ISP Download Cable (included in ATF15xx-DK3-U), and the ATDH1150VPC LPT-based ISP Download Cable to users for programming of these CPLDs using a Windows based host PC running the Atmel ATMISP ATF15xx ISP programming software. These programming tools are mainly designed for development environments, and they are less suitable for production programming than the commercial grade production programmers available from third-party device programming tool vendors as described in Section 2 below.

ATF15xx-DK3-U: http://www.atmel.com/tools/ATF15XX-DK3-U.aspx

ATDH1150USB: http://www.atmel.com/tools/ATDH1150USB.aspx

ATDH1150VPC: http://www.atmel.com/tools/ATDH1150VPC.aspx

ATMISP: http://www.atmel.com/tools/ATMISP.aspx

2 Third-party Programming Tools

Many programming tool vendors offer stand-alone and in-system programmers that can be used to program Atmel PLDs in the production and development environments. For production programming of Atmel PLDs, the use of commercial grade production programmers from third-party device programming tool vendors is recommended. Multi-site (or “gang”) programmers are also available from various vendors to allow users to program multiple devices at the same time to increase the programming throughput for high volume production programming. The below table lists some of the third-party device programming tool vendors that offer programming tools for Atmel PLDs and the types of device programming tools offered (please check with vendors to confirm offering).

Table 2-1. Third-party Device Programming Tool Vendors

Company Name	Stand-alone (Single-site)	Stand-alone (Multi-site)	In-system	Website
Advantech Equipment	✓			www.aec.com.tw
Advin Systems	✓	✓		www.advin.com
BPM Microsystems[1]	✓	✓	✓	www.bpmmicro.com
Data I/O[1]	✓	✓		www.dataio.com
Dataman	✓	✓	✓	www.dataman.com
EE Tools	✓	✓		www.eetools.com
ELNEC	✓	✓	✓	www.elnec.com
HI-LO Systems[1]	✓	✓		www.hilosystems.com
Kanda[1]	✓		✓	www.kanda.com
Leap Electronic	✓	✓		www.leap.com.tw
Logical Devices[1]	✓	✓	✓	www.logicaldevices.com
Minato	✓	✓		www.minato.co.jp
Needham’s Electronics[1]	✓		✓	www.needhams.com
Phyton	✓	✓		www.phyton.com
System General[1]	✓	✓		www.sg.com.tw
Tribal Microsystems[1]	✓	✓		www.tribalmicro.com
Xeltek	✓	✓	✓	www.xeltek.com

Note: 1. The PLD programming supports from this vendor had been qualified by the Atmel PLD Applications group.

3 Third-party Programming Services

Some of the Atmel distributors (i.e. Arrow, Avnet, Digi-Key) and third-party device programming tool vendors (i.e. HI-LO Systems, Dataman, Xeltek) also offer programming services for Atmel PLDs and other programmable devices. There are also many device programming service providers (i.e. A&J Programming, Action Circuits, ProEx, Reel Service) available worldwide that offer programming services for various types of programmable devices including PLDs.

4 In-circuit Testing

For the ATF15xx CPLDs with JTAG ISP support, it is possible to program these devices after they are mounted on the PCB using in-circuit testers during board level production test flow. Typically, the test program development software for the in-circuit tester obtains all the necessary programming information for the ATF15xx CPLD from the Serial Vector Format (SVF) file which is generated by the ATMISP software.

5 Revision History

Doc Rev.	Date	Comments
A	08/2015	Initial document release.

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