

SmartDesign MSS

External Memory Controller (EMC) Configuration

Actel Corporation, Mountain View, CA 94043

© 2010 Actel Corporation. All rights reserved.

Printed in the United States of America

Part Number: 5-02-00226-0

Release: July 2010

No part of this document may be copied or reproduced in any form or by any means without prior written consent of Actel.

Actel makes no warranties with respect to this documentation and disclaims any implied warranties of merchantability or fitness for a particular purpose. Information in this document is subject to change without notice. Actel assumes no responsibility for any errors that may appear in this document.

This document contains confidential proprietary information that is not to be disclosed to any unauthorized person without prior written consent of Actel Corporation.

Trademarks

Actel and the Actel logo are registered trademarks of Actel Corporation.

Adobe and Acrobat Reader are registered trademarks of Adobe Systems, Inc.

All other products or brand names mentioned are trademarks or registered trademarks of their respective holders.

Table of Contents

1	Configuration Options	5
	Connectivity Options	5
2	Port Description	7
A	Product Support	9
	Actel Customer Technical Support Center	9
	Actel Technical Support	9
	Website	9
	Contacting the Customer Technical Support Center	9

Configuration Options

The EMC provides a seamless interface to external memories. It supports asynchronous memories and synchronous SRAM memory types.

For complete details please refer to the [Actel SmartFusion Microcontroller Subsystem User's Guide](#).

The EMC Configurator helps you configure the SmartFusion MSS External Memory Controller.

Connectivity Options

The EMC provides 2 chip select, each addressing 64MB of address space. The EMC configurator provides two regions (chip select 0 and 1) that can be configured independently.

In this document, we provide a mapping between the EMC configurator's labels and the EMC register bits as defined in the [Actel SmartFusion Microcontroller Subsystem User's Guide](#).

Table 1-1 · Configurator Labels and EMC Register Bits

Configurator Parameter Label	Handbook Description
Memory Type: - Asynchronous RAM - Synchronous RAM - NOR flash - None	External Memory Type: - Asynchronous /PSRAM memory - Synchronous memory - NOR flash memory - No memory assigned
Port Size: - Byte - Half Word	Port Size: 8-bit EMD data bus 16-bit EMD data bus
Invert Read/Write Signal Polarity	Read/Write polarity
Read Latency for First Access (HCLK cycles)	Read data latency, first access
Read Latency for Remaining Accesses (HCLK cycles)	Read data latency, next access
Write Latency (HCLK cycles)	Write data latency
Use Alternate Chip Selection	Chip select falling edge
Configure BYTEN port as: - Write Enable - Byte Enable	Write enable/byte enable
Pipeline Synchronous Read Cycle	Pipeline read
Pipeline Synchronous Write Cycle	Pipeline write
Inter Device Latency (HCLK cycles)	Inter device delay

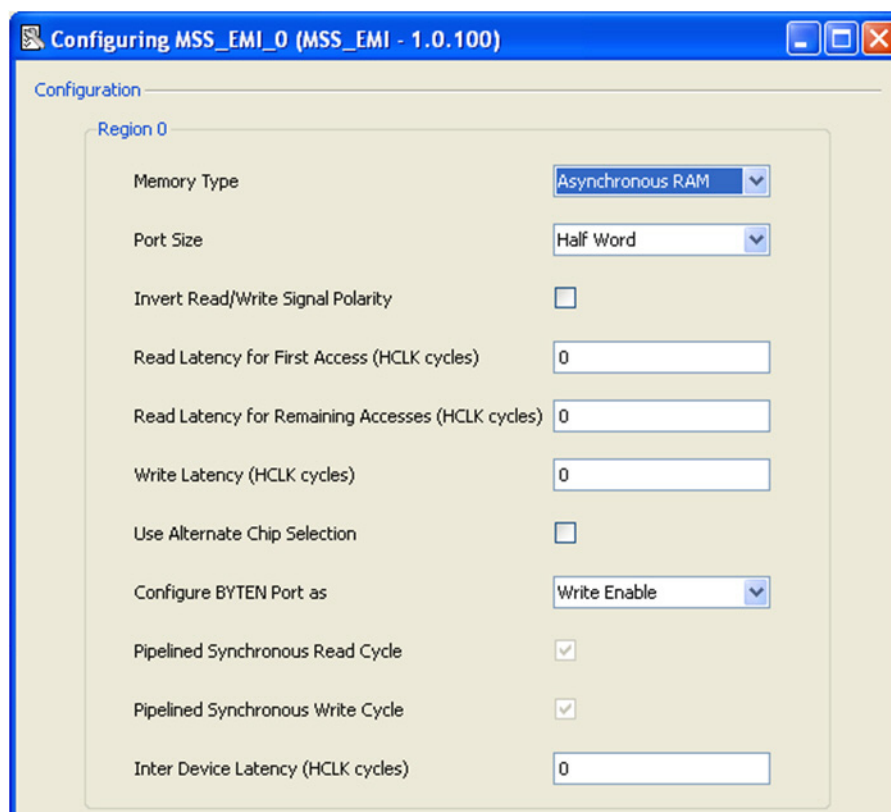


Figure 1-1 · Region 0 Configuration Screen

Port Description

Table 2-1 · EMC Port Description

Port Name	Port Group	Direction	PAD?	Description
AB[25:0]	PADs	Out	Yes	Address bus
DB[N-1:0]	PADs	Inout	Yes	Bidirectional data bus. N is 8 or 16 based on the port size selection of the two EMC regions
BYTEN[1:0]	PADs	Out	Yes	Byte lane signals (BYTE_EN[1:0] in datasheet)
CS1_N	PADs	Out	Yes	Chip select 1
CS0_N	PADs	Out	Yes	Chip select 0
OEN1_N	PADs	Out	Yes	Output enable 1 (OE1_N in datasheet)
OEN0_N	PADs	Out	Yes	Output enable 0 (OE0_N in datasheet)
RW_N	PADs	Out	Yes	Read/write
CLK	PADs	Out	Yes	Clock

Notes:

- PAD ports are automatically promoted to top throughout the design hierarchy.
- Non-PAD ports must be promoted manually to the top level from the MSS configurator canvas to be available as the next level of hierarchy.

Product Support

Actel backs its products with various support services including Customer Service, a Customer Technical Support Center, a web site, an FTP site, electronic mail, and worldwide sales offices. This appendix contains information about contacting Actel and using these support services.

Customer Service

Contact Customer Service for non-technical product support, such as product pricing, product upgrades, update information, order status, and authorization.

From Northeast and North Central U.S.A., call **650.318.4480**

From Southeast and Southwest U.S.A., call **650.318.4480**

From South Central U.S.A., call **650.318.4434**

From Northwest U.S.A., call **650.318.4434**

From Canada, call **650.318.4480**

From Europe, call **650.318.4252** or **+44 (0) 1276 401 500**

From Japan, call **650.318.4743**

From the rest of the world, call **650.318.4743**

Fax, from anywhere in the world **650.318.8044**

Actel Customer Technical Support Center

Actel staffs its Customer Technical Support Center with highly skilled engineers who can help answer your hardware, software, and design questions. The Customer Technical Support Center spends a great deal of time creating application notes and answers to FAQs. So, before you contact us, please visit our online resources. It is very likely we have already answered your questions.

Actel Technical Support

Visit the [Actel Customer Support website \(www.actel.com/support/search/default.aspx\)](http://www.actel.com/support/search/default.aspx) for more information and support. Many answers available on the searchable web resource include diagrams, illustrations, and links to other resources on the Actel web site.

Website

You can browse a variety of technical and non-technical information on Actel's [home page](http://www.actel.com), at www.actel.com.

Contacting the Customer Technical Support Center

Highly skilled engineers staff the Technical Support Center from 7:00 A.M. to 6:00 P.M., Pacific Time, Monday through Friday. Several ways of contacting the Center follow:

Email

You can communicate your technical questions to our email address and receive answers back by email, fax, or phone. Also, if you have design problems, you can email your design files to receive assistance. We constantly monitor the email account throughout the day. When sending your request to us, please be sure to include your full name, company name, and your contact information for efficient processing of your request.

The technical support email address is tech@actel.com.

Phone

Our Technical Support Center answers all calls. The center retrieves information, such as your name, company name, phone number and your question, and then issues a case number. The Center then forwards the information to a queue where the first available application engineer receives the data and returns your call. The phone hours are from 7:00 A.M. to 6:00 P.M., Pacific Time, Monday through Friday. The Technical Support numbers are:

650.318.4460

800.262.1060

Customers needing assistance outside the US time zones can either contact technical support via email (tech@actel.com) or contact a local sales office. [Sales office listings](#) can be found at www.actel.com/company/contact/default.aspx.



Actel is the leader in low-power and mixed-signal FPGAs and offers the most comprehensive portfolio of system and power management solutions. Power Matters. Learn more at www.actel.com.

Actel Corporation • 2061 Stierlin Court • Mountain View, CA 94043 • USA

Phone 650.318.4200 • Fax 650.318.4600 • Customer Service: 650.318.1010 • Customer Applications Center: 800.262.1060

Actel Europe Ltd. • River Court, Meadows Business Park • Station Approach, Blackwater • Camberley Surrey GU17 9AB • United Kingdom

Phone +44 (0) 1276 609 300 • Fax +44 (0) 1276 607 540

Actel Japan • EXOS Ebisu Building 4F • 1-24-14 Ebisu Shibuya-ku • Tokyo 150 • Japan

Phone +81.03.3445.7671 • Fax +81.03.3445.7668 • <http://jp.actel.com>

Actel Hong Kong • Room 2107, China Resources Building • 26 Harbour Road • Wanchai • Hong Kong

Phone +852 2185 6460 • Fax +852 2185 6488 • www.actel.com.cn