Atmel AT697F

Rad-Hard 32-bit SPARC v8 Processor

ERRATA SHEET

Active Errata List

1. Odd-numbered FPU register dependency not properly checked in some double-precision FPU operations

Table 1. Errata History

Product Release	Errata List
All AT697F part-numbers	1

Errata Description

1. Odd-numbered FPU register dependency not properly checked in some double-precision FPU operations

Data dependency is not properly checked between a load singleword floating-point instruction (LDF) involving an odd-numbered floating-point register as a destination of the load and an immediately following double-precision floating-point instruction (FADDd, FSUBd, FMULd, FDIVd or FSQRTd) that satisfies all of the following conditions:

- the odd-numbered floating-point register is used as (part of) a source operand
- the destination floating-point register is also a source operand
- in an FSUBd or FDIVd, the two source operands are different registers

In this case, the final result of the double-precision floating-point instruction will be wrong.

Other double-precision floating-point instructions (FCMPd, FCMPEd, FdTOi and FdTOs) are not affected by this issue and will operate as expected.

The error case appears when any of the six following sequences of instructions is present (n in [0:31], x and y as different even numbers in [0:30]):

Case 1:

```
LD [%rn], %fx+1
FPOPd(1) %fx, %fy, %fx
```

Case 2:

```
LD [%rn], %fx+1
FPOPd(1) %fy, %fx, %fx
```

Case 3:

```
LD [%rn], %fx+1
FPOPd(1) %fx, %fy, %fy
```

Case 4:

```
LD [%rn], %fx+1
FPOPd(1) %fy, %fx, %fy
```

Case 5:

```
LD [%rn], %fx+1
FPOPd(2) %fx, %fx, %fx
```

Case 6:

```
LD [%rn], %fx+1
SQRTd %fx, %fx
```

Notes: 1. *FPOPd* is one of FADDd, FSUBd, FMULd or FDIVd.

2. *FPOPd* is one of FADDd or FMULd (FSUBd and FDIVd operate as expected).

Workarounds

If direct control over assembly language is possible, simply insert a NOP before the double-precision floating-point instruction (case 1 to 6):

LD [%r_n], %f_{x+1}
NOP
FPOPd <same registers set as described above>

If direct control over assembly language is not possible (high-level programming language such as C), checking the SPARC binary code against any of the six above mentioned faulty sequences of instructions shall be done using the code-checker program provided by Atmel (*search for* `doc7787` on Atmel web site).

Although there is a very low likelihood of occurrence with high-level programming languages, customers facing this problem should contact the SPARC hotline (`sparc-applab.hotline@nto.atmel.com`).

Atmel Corporation
2325 Orchard Parkway
San Jose, CA 95131
USA
Tel: (+1)(408) 441-0311
Fax: (+1)(408) 487-2600
www.atmel.com

Atmel Asia Limited
Unit 01-5 & 16, 19F
BEA Tower, Millennium City 5
418 Kwun Tong Road
Kwun Tong, Kowloon
HONG KONG
Tel: (+852) 2245-6100
Fax: (+852) 2722-1369

Atmel Munich GmbH
Business Campus
Parkring 4
D-85748 Garching b. Munich
GERMANY
Tel: (+49) 89-31970-0
Fax: (+49) 89-3194621

Atmel Japan G.K.
16F Shin-Osaki Kangyo Building
1-6-4 Osaki
Shinagawa-ku, Tokyo 141-0032
JAPAN
Tel: (+81)(3) 6417-0300
Fax: (+81)(3) 6417-0370

© 2012 Atmel Corporation. All rights reserved. / Rev.: 41003A-AERO-04/12

Atmel®, logo and combinations thereof, and others are registered trademarks or trademarks of Atmel Corporation or its subsidiaries. Other terms and product names may be trademarks of others.

Disclaimer: The information in this document is provided in connection with Atmel products. No license, express or implied, by estoppel or otherwise, to any intellectual property right is granted by this document or in connection with the sale of Atmel products. EXCEPT AS SET FORTH IN THE ATMEL TERMS AND CONDITIONS OF SALES LOCATED ON THE ATMEL WEBSITE, ATMEL ASSUMES NO LIABILITY WHATSOEVER AND DISCLAIMS ANY EXPRESS, IMPLIED OR STATUTORY WARRANTY RELATING TO ITS PRODUCTS INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTY OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR NON-INFRINGEMENT. IN NO EVENT SHALL ATMEL BE LIABLE FOR ANY DIRECT, INDIRECT, CONSEQUENTIAL, PUNITIVE, SPECIAL OR INCIDENTAL DAMAGES (INCLUDING, WITHOUT LIMITATION, DAMAGES FOR LOSS AND PROFITS, BUSINESS INTERRUPTION, OR LOSS OF INFORMATION) ARISING OUT OF THE USE OR INABILITY TO USE THIS DOCUMENT, EVEN IF ATMEL HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. Atmel makes no representations or warranties with respect to the accuracy or completeness of the contents of this document and reserves the right to make changes to specifications and products descriptions at any time without notice. Atmel does not make any commitment to update the information contained herein. Unless specifically provided otherwise, Atmel products are not suitable for, and shall not be used in, automotive applications. Atmel products are not intended, authorized, or warranted for use as components in applications intended to support or sustain life.