DI Errata

- ATAM893S
- ATAM894P
- ATAR092P
- ATAR892P
- ATAR090H
- AIANUSUN
- ATAR890H
- ATAR080F
- ATA6020N
- ATAR510F

ATAR862N3/N4/N8

The latest product enhancement (PCN HC030703 DI enhancement) introduced to all MARC4 products during 2003, leads, under some conditions, to an unforeseen and unwanted behavior. The circuit may not process interrupts correctly. All above mentioned MARC4 products are affected.

Description

If a DI command is immediately followed by a CALL or SCALL command and an interrupt meets this DI command, this interrupt is kept in the interrupt active register permanently despite a correct RTI execution. Even if the EI command in the interrupted program has been executed, this bit in the interrupt active register stays set and disables the execution of any interrupt of the same or lower priority. Only an interrupt with a higher priority or a reset is able to solve this blocking status.

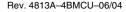
If the command following the DI is a NOP, the interrupt active register usually is cleared correctly after an RTI and executing interrupts then continues normally.



MARC4 4-bit Microcontrollers

ATAM893S ATAM894P ATAR092/892P ATAR090/890H ATAR080F ATA6020N ATAR510F ATAR862N3/4/8

Errata Sheet







Workaround

MTP Parts

- a) Experienced customers using Atmel MTP parts (ATAM893S, ATAM894P) can modify the HEX-file directly. Within each interrupt service routine, replace the HEX-code for CCR! in front of the RTI with a SCALL to a free address. Introduce the HEX-codes for the commands LIT_1, OR, CCR! and EXIT at this address. Now, with each RTI, the interrupt enable flag is set. This software modification overrides the last hardware modification, i.e., the parts behave as if not having received DI-enhancement, and the interrupt active register will be cleared correctly.
- b1) An equivalent modification can be done in the source code, but the modification depends on the content the compiler saved at the beginning of an interrupt service routine:

In this case, CCR, X and Y registers were saved, therefore, the modification should look as follows:

```
2>R 2>R 1 or 2R> 2R>
```

either at the beginning or at the end of the interrupt service routine.

b2) If only CCR and one of the registers were saved:

```
01E0 :INT7
01E0 0D CCR@ \$SAVEREG
01E1 73 Y@
```

The modification looks as follows:

```
ROT 1 or <ROT
```

c) Customers using MTP parts may switch their order to the predecessor version.

ROM Parts

Customers using ROM parts may switch their order to the predecessor version.

Up to now it has not occurred, that parts working correctly under all conditions might fail in the future or under different environmental conditions.



Atmel Corporation

2325 Orchard Parkway San Jose, CA 95131, USA Tel: 1(408) 441-0311 Fax: 1(408) 487-2600

Regional Headquarters

Europe

Atmel Sarl Route des Arsenaux 41 Case Postale 80 CH-1705 Fribourg Switzerland

Tel: (41) 26-426-5555 Fax: (41) 26-426-5500

Asia

Room 1219 Chinachem Golden Plaza 77 Mody Road Tsimshatsui East Kowloon Hong Kong Tel: (852) 2721-9778

Fax: (852) 2721-9778

Japan

9F, Tonetsu Shinkawa Bldg. 1-24-8 Shinkawa Chuo-ku, Tokyo 104-0033 Japan

Tel: (81) 3-3523-3551 Fax: (81) 3-3523-7581

Atmel Operations

Memory

2325 Orchard Parkway San Jose, CA 95131, USA Tel: 1(408) 441-0311 Fax: 1(408) 436-4314

Microcontrollers

2325 Orchard Parkway San Jose, CA 95131, USA Tel: 1(408) 441-0311 Fax: 1(408) 436-4314

La Chantrerie BP 70602 44306 Nantes Cedex 3, France Tel: (33) 2-40-18-18-18 Fax: (33) 2-40-18-19-60

ASIC/ASSP/Smart Cards

Zone Industrielle 13106 Rousset Cedex, France Tel: (33) 4-42-53-60-00 Fax: (33) 4-42-53-60-01

1150 East Cheyenne Mtn. Blvd. Colorado Springs, CO 80906, USA

Tel: 1(719) 576-3300 Fax: 1(719) 540-1759

Scottish Enterprise Technology Park Maxwell Building East Kilbride G75 0QR, Scotland

Tel: (44) 1355-803-000 Fax: (44) 1355-242-743

RF/Automotive

Theresienstrasse 2 Postfach 3535 74025 Heilbronn, Germany Tel: (49) 71-31-67-0 Fax: (49) 71-31-67-2340

1150 East Cheyenne Mtn. Blvd. Colorado Springs, CO 80906, USA

Tel: 1(719) 576-3300 Fax: 1(719) 540-1759

Biometrics/Imaging/Hi-Rel MPU/ High Speed Converters/RF Datacom

Avenue de Rochepleine BP 123

38521 Saint-Egreve Cedex, France

Tel: (33) 4-76-58-30-00 Fax: (33) 4-76-58-34-80

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