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About Cypress

Cypress is the leader in advanced embedded system solutions for the world's most innovative automotive, industrial, smart home appliances, consumer electronics and medical products. Cypress' microcontrollers, analog ICs, wireless and USB-based connectivity solutions and reliable, high-performance memories help engineers design differentiated products and get them to market first. Cypress is committed to providing customers with the best support and development resources on the planet enabling them to disrupt markets by creating new product categories in record time. To learn more, go to www.cypress.com.

June 06, 2012

Chip Errata for the MB9AB40N/A40N/340N/140N Series, FM3 Family Microcontroller

This document describes the errata for the MB9AB40N/A40N/340N/140N Series FM3 Family Microcontroller. Details include Flash memory dual operation problems, scope of impact and available workarounds. Compare this document to the device's data sheet for a complete functional description.

Contact your local Cypress Sales Representative if you have questions.

Part Numbers Affected

Part Number
MB9AB40N/A40N/340N/140N Series

Problem Description

In the FLASH macro mounted on the target products in Item 3, two problems were found.
We would provide the information on the problems and their countermeasures.
Please accept our apology for the inconvenience caused by these failures.
We appreciate if you confirm the failures described in this document and take the appropriate countermeasures.

Outline of Problem1
During writing (programming) to FLASH memory of an upper bank, FLASH memory of a lower bank could not be read at a specific timing in some operation combination.

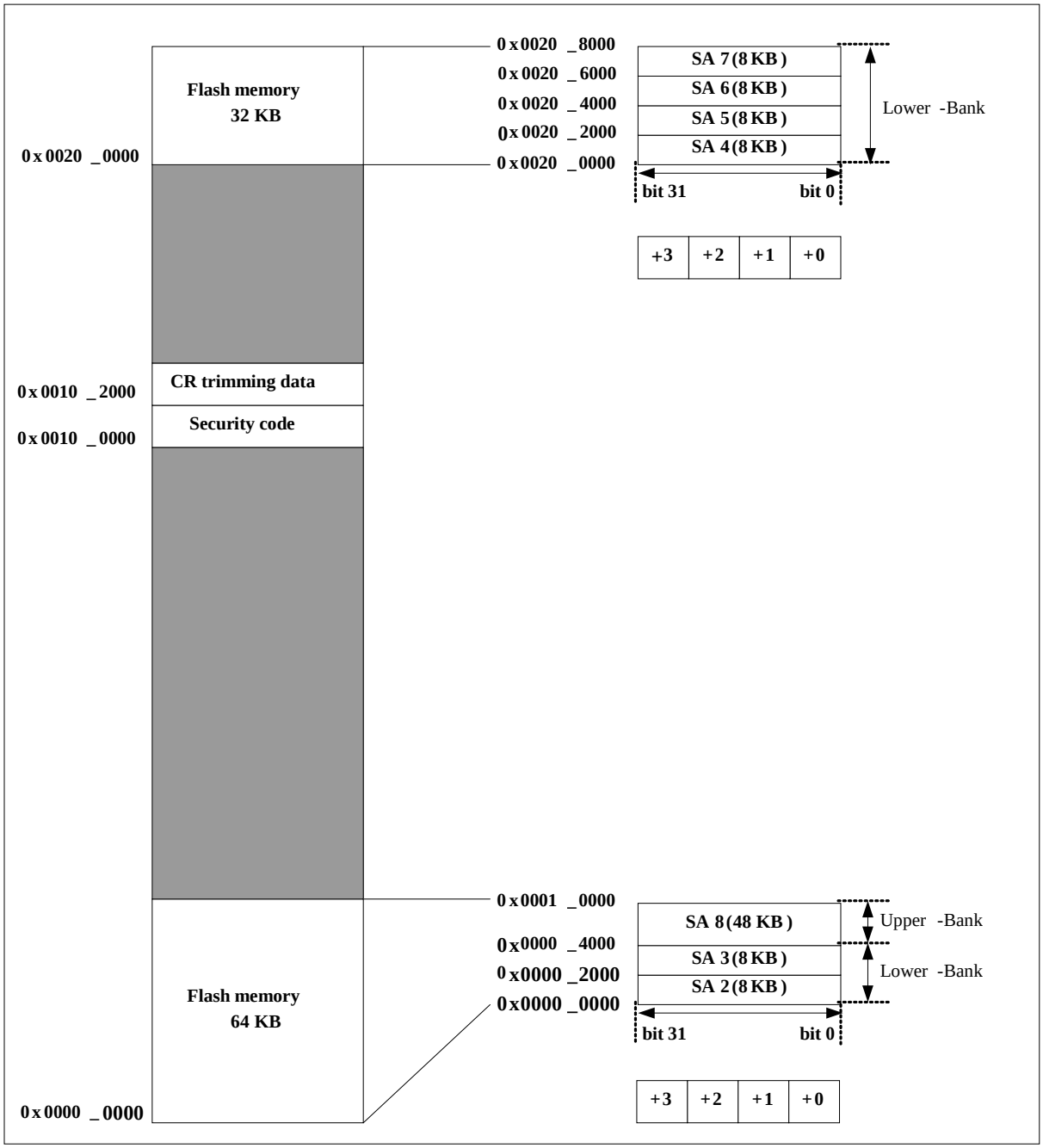
Outline of Problem 2
When writing is executed during sector erase suspend, FLASH memory could not be read correctly at a specific timing.

Problem Conditions

(1) Occurrence Conditions of Problem 1

At the specific timing, the FLASH memory lower bank (smaller sector) is not correctly read while writing(programming) to the FLASH memory upper bank (larger sector). Therefore, the instruction in the lower bank could not be read correctly and the writing sequence to the upper bank executed by the instruction would lead to a hard fault or run-away. Moreover, when the lower bank is read while writing to the upper bank by the instruction on RAM, an incorrect value might be read.

Figure 1. FLASH Memory MAP



The problem occurs at the combination of the following operations.

Upper bank (Larger sector)	Lower bank (Smaller sector)	Judgment
Instruction/data reading		Normal operation
Instruction/data reading	Writing	Normal operation
Instruction/data reading	Sector erase	Normal operation
Writing	**Instruction/data reading**	**At a specific timing, a correct value could not be read.**
Sector erase	Instruction/data reading	Normal operation
FLASH memory(all sectors) erase		Normal operation

(2) Occurrence Condition of Problem 2

When writing to the upper bank or the lower bank at a sector erase suspend, reading to the opposite bank might result in reading of an incorrect value at a specific timing. Therefore, FLASH memory could not be correctly read in the following flow, and a hard fault or a run-away might occur.

(a) Erase a sector of the lower bank.

(b) Suspend the sector erase operation.

(c) Write to a different sector of the lower bank.

(d) Execute an instruction in the upper bank.

Different from Problem 1, this problem would occur in the reverse operation combination of used banks.

The problem occurs at some combinations of the following operations.

Operation during suspend		Judgement
Upper bank (Larger sector)	**Lower bank (Smaller sector)**	
Instruction/data reading		Normal operation
Instruction/data reading	Writing	At a specific timing, a correct value cannot be read.
Writing	**Instruction/data reading**	

Affected Devices

The following devices are affected:

Series names	Part number of affected products
MB9A140N series	MB9AF141L, MB9AF141M, MB9AF141N MB9AF142L, MB9AF142M, MB9AF142N MB9AF144L, MB9AF144M, MB9AF144N
MB9A340N series	MB9AF341L, MB9AF341M, MB9AF341N MB9AF342L, MB9AF342M, MB9AF342N MB9AF344L, MB9AF344M, MB9AF344N
MB9AA40N series	MB9AFA41L, MB9AFA41M, MB9AFA41N MB9AFA42L, MB9AFA42M, MB9AFA42N MB9AFA44L, MB9AFA44M, MB9AFA44N
MB9AB40N series	MB9AFB41L, MB9AFB41M, MB9AFB41N MB9AFB42L, MB9AFB42M, MB9AFB42N MB9AFB44L, MB9AFB44M, MB9AFB44N

Affected Modules

This problem is affecting the operation of the FLASH memory

Root Cause

The failures are caused by design mistake.

Workaround

To solve these problems we would re-design the circuit of the affected devices.
Before the re-design, the problems could be avoided by taking the following countermeasures:

- Countermeasures against Problem 1
To rewrite the upper bank of FLASH memory, store the write instruction in RAM instead of the lower bank and read the instruction from RAM to execute. Do not access the lower bank until the write operation is completed (RDY=1). Especially to disable the vector fetch to the lower bank of the FLASH memory at an interrupt occurred, the interrupt should be prohibited or the vector address should be set to RAM by the vector table offset register.

- Countermeasures against Problem 2
We could not provide an effective countermeasure against Problem 2.
So, do not execute the write operation to a different sector in the same bank at sector erase suspend.

Corrective action by Cypress Semiconductor

Cypress Semiconductor will correct these problems by a redesign of the affected devices
New part numbers are made by adding “A” at the end of the previous product types and new device delivery schedule is as follows:

Series name or product type	ES Delivery Date	Mass-production Start Date
MB9AF141LA, MB9AF141MA, MB9AF141NA MB9AF142LA, MB9AF142MA, MB9AF142NA MB9AF144LA, MB9AF144MA, MB9AF144NA	The 31st of August, 2012	The 28th of September ,2012
MB9AF341LA, MB9AF341MA, MB9AF341NA MB9AF342LA, MB9AF342MA, MB9AF342NA MB9AF344LA, MB9AF344MA, MB9AF344NA	The 31st of August, 2012	The 28th of September, 2012
MB9AFA41LA, MB9AFA41MA, MB9AFA41NA MB9AFA42LA, MB9AFA42MA, MB9AFA42NA MB9AFA44LA, MB9AFA44MA, MB9AFA44NA	The 31st of August, 2012	The 28th of September ,2012
MB9AFB41LA, MB9AFB41MA, MB9AFB41NA MB9AFB42LA, MB9AFB42MA, MB9AFB42NA MB9AFB44LA, MB9AFB44MA, MB9AFB44NA	The 31st of August, 2012	The 28th of September, 2012

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Rev.	**ECN No.**	**Orig. of Change**	**Description of Change**
**	_	YUIS	Initial release
*A	5232550	YUIS	Migrated to Cypress format

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