

Unexpected Operation After an Illegal Command Is Issued to a Protected Area of HCS08 Flash

1 Problem Description

A subtle problem was discovered in the Flash memory of HCS08 MCUs. The problem is related to the block protection mechanism when invalid command codes are performed. This issue does not affect normal operation of the module when program and erase operations are performed correctly.

When a command is initiated to a protected area of Flash, and that command is not one of the valid command codes, the ACCERR flag is set but the PVIOL flag does not set as expected. This prevents the internal protection violation condition from being cleared after the invalid command. After clearing the ACCERR flag, the next attempt to issue a new valid command to an unprotected area of Flash will result in the PVIOL flag being set unexpectedly, and the new command will not be performed.

2 Workaround

If you use only valid command codes, this issue does not arise. You should write your application program so it checks for both ACCERR and PVIOL errors. If any error is detected, ensure the original command was valid and did not attempt to access a protected location. If the location was a protected address, correct the problem and repeat the command to a valid unprotected Flash location. In the case where PVIOL is set, ensure that the command did not include a write to a protected address. If the address was unprotected, the PVIOL error flag could be left over from a previous illegal command code. Clear the PVIOL error flag and re-issue the command.

3 Mask Sets Affected

- MC9S08AC16 — 0M89E
- MC9S08AW60 — 0L16X, 0M75B, 1M75B, 3M75B, 5M75B
- PC9S08GT16A — 2M70C
- MC9S08JR12 — 0L95Y
- PC9S08LC60 — 0M78B
- MC9S08QD4 — 0M1SD
- MC9S08QG8/4 — 0M77B, 1M77B, 2M77B, 3M77B
- MC9S08RA16 — 0M46E
- MC9S08RT16 — 0M14A

How to Reach Us:

Home Page:

www.freescale.com

E-mail:

support@freescale.com

USA/Europe or Locations Not Listed:

Freescale Semiconductor
Technical Information Center, CH370
1300 N. Alma School Road
Chandler, Arizona 85224
+1-800-521-6274 or +1-480-768-2130
support@freescale.com

Europe, Middle East, and Africa:

Freescale Halbleiter Deutschland GmbH
Technical Information Center
Schatzbogen 7
81829 Muenchen, Germany
+44 1296 380 456 (English)
+46 8 52200080 (English)
+49 89 92103 559 (German)
+33 1 69 35 48 48 (French)
support@freescale.com

Japan:

Freescale Semiconductor Japan Ltd.
Headquarters
ARCO Tower 15F
1-8-1, Shimo-Meguro, Meguro-ku,
Tokyo 153-0064
Japan
0120 191014 or +81 3 5437 9125
support.japan@freescale.com

Asia/Pacific:

Freescale Semiconductor Hong Kong Ltd.
Technical Information Center
2 Dai King Street
Tai Po Industrial Estate
Tai Po, N.T., Hong Kong
+800 2666 8080
support.asia@freescale.com

For Literature Requests Only:

Freescale Semiconductor Literature Distribution Center
P.O. Box 5405
Denver, Colorado 80217
1-800-441-2447 or 303-675-2140
Fax: 303-675-2150
LDCForFreescaleSemiconductor@hibbertgroup.com

Information in this document is provided solely to enable system and software implementers to use Freescale Semiconductor products. There are no express or implied copyright licenses granted hereunder to design or fabricate any integrated circuits or integrated circuits based on the information in this document.

Freescale Semiconductor reserves the right to make changes without further notice to any products herein. Freescale Semiconductor makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does Freescale Semiconductor assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation consequential or incidental damages. "Typical" parameters that may be provided in Freescale Semiconductor data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals", must be validated for each customer application by customer's technical experts. Freescale Semiconductor does not convey any license under its patent rights nor the rights of others. Freescale Semiconductor products are not designed, intended, or authorized for use as components in systems intended for surgical implant into the body, or other applications intended to support or sustain life, or for any other application in which the failure of the Freescale Semiconductor product could create a situation where personal injury or death may occur. Should Buyer purchase or use Freescale Semiconductor products for any such unintended or unauthorized application, Buyer shall indemnify and hold Freescale Semiconductor and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that Freescale Semiconductor was negligent regarding the design or manufacture of the part.

Freescale™ and the Freescale logo are trademarks of Freescale Semiconductor, Inc. All other product or service names are the property of their respective owners.

© Freescale Semiconductor, Inc. 2006. All rights reserved.

RoHS-compliant and/or Pb-free versions of Freescale products have the functionality and electrical characteristics as their non-RoHS-compliant and/or non-Pb-free counterparts. For further information, see <http://www.freescale.com> or contact your Freescale sales representative.

For information on Freescale's Environmental Products program, go to <http://www.freescale.com/epp>.