

## Motorola Semiconductor Engineering Bulletin

---

# EB256

### Use of the Lock Bit on Modular Microcontrollers with FLASH EEPROM

By Charles Melear  
Austin, Texas

#### General Information

---

The LOCK bit in the FEEMCR register is used to prevent software from writing the base address registers of the FLASH EEPROM modules.

That is all that the LOCK bit does. The LOCK bit does not prevent the software from programming, erasing, or reprogramming any FLASH EEPROM cell.

#### Shadow Bits

---

To restate, regardless of the state of the LOCK bit, the software can program to the FLASH EEPROM array or any registers formed from FLASH EEPROM cells, such as the shadow registers.

#### Guidelines

---


To understand why the LOCK bit is present, the user must understand how the shadow bits work.



These are guidelines:

1. Upon the release of reset, the contents of the shadow registers are written into the actual registers being shadowed. If the shadow registers have not been programmed, all of the bits will be at logic 1. Thus, when the device is reset, all of the actual registers will be written to \$FFFF.
2. The shadow registers can be programmed at any time. Programming the shadow registers does not affect the actual registers until the device encounters a subsequent reset. When a reset does occur, the new contents of the shadow registers are written into the actual registers.
3. If the LOCK bit is set, the actual base address registers cannot be modified. In other words, the base address of the internal FLASH EEPROM modules cannot be changed under software control. To change the actual base address registers, the shadow registers must be reprogrammed and the device must encounter a reset.
4. If the LOCK bit is clear, the actual base address registers can be written by the CPU at any time.

The LOCK bit was incorporated for one purpose only: to prevent user software or run away software from reprogramming the base address registers for the EEPROM modules.

Motorola reserves the right to make changes without further notice to any products herein. Motorola makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does Motorola 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 which may be provided in Motorola 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. Motorola does not convey any license under its patent rights nor the rights of others. Motorola 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 Motorola product could create a situation where personal injury or death may occur. Should Buyer purchase or use Motorola products for any such unintended or unauthorized application, Buyer shall indemnify and hold Motorola 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 Motorola was negligent regarding the design or manufacture of the part. Motorola and  are registered trademarks of Motorola, Inc. Motorola, Inc. is an Equal Opportunity/Affirmative Action Employer.

#### How to reach us:

**USA/EUROPE/Locations Not Listed:** Motorola Literature Distribution, P.O. Box 5405, Denver, Colorado 80217, 1-800-441-2447 or 1-303-675-2140. Customer Focus Center, 1-800-521-6274

**JAPAN:** Motorola Japan Ltd.: SPD, Strategic Planning Office, 141, 4-32-1 Nishi-Gotanda, Shinagawa-ku, Tokyo, Japan, 03-5487-8488

**ASIA/PACIFIC:** Motorola Semiconductors H.K. Ltd., Silicon Harbour Centre, 2 Dai King Street, Tai Po Industrial Estate, Tai Po, New Territories, Hong Kong, 852-26629298

**Mfax™, Motorola Fax Back System:** RMFAX0@email.sps.mot.com; <http://sps.motorola.com/mfax/>;  
TOUCHTONE, 1-602-244-6609; US and Canada ONLY, 1-800-774-1848

**HOME PAGE:** <http://motorola.com/sps/>

Mfax is a trademark of Motorola, Inc.

© Motorola, Inc., 1999



**MOTOROLA**

EB256/D

**For More Information On This Product,  
Go to: [www.freescale.com](http://www.freescale.com)**