

---

## Mask Set Errata for Mask 2M00S

### Introduction

This report applies to mask 2M00S for these products:

- MCF51EM256
- MCF51EM128

The mask set is identified by a 5-character code consisting of a version number, a letter, two numerical digits, and a letter, for example 0J27F. All standard devices are marked with a mask set number and a date code.

Device markings indicate the week of manufacture and the mask set used. The date is coded as four numerical digits where the first two digits indicate the year and the last two digits indicate the work week. For instance, the date code "0301" indicates the first week of the year 2003.

Some MCU samples and devices are marked with an SC, PC, or XC prefix. An SC prefix denotes special/custom device. A PC prefix indicates a prototype device which has undergone basic testing only. An XC prefix denotes that the device is tested but is not fully characterized or qualified over the full range of normal manufacturing process variations. After full characterization and qualification, devices will be marked with the MC or SC prefix.

### **SECF206-iRTC: iRTC repeatedly loops within the hour after Daylight Saving Time (DST) falls back**

**Errata type:** Silicon

**Affects:** iRTC

**Description:** iRTC repeatedly loops within the hour after Daylight Saving Time (DST) falls back. This erratum only impacts iRTC when daylight saving falls back. Other features including DST forward are not impacted.

Following is an example where the erratum occurs:

If the iRTC is configured to have DST forward on day A at 14:00:00 and to have DST falls back on day B at 16:00:00 then the following behavior will be observed.

Forward on date A:  
13:59:59 ->15:00:00

Fallback on date B:  
The erratum behavior occurs in ***bold italics***: 15:59:59 -> 15:00:00 -> 15:59:59 -> ***15:00:00***  
The correct behavior occurs in **bold**: 15:59:59 ->15:00:00 -> 15:59:59 -> **16:00:00**

In the example above, the iRTC correctly rolls from 15:59:59 to 15:00:00 when fallback occurs. After the fallback occurs, the next hour roll over should be from 15:59:59 to 16:00:00 but it is incorrectly roll back to 15:00:00. iRTC then falsely loops between 15:59:59 and 15:00:00 repeatedly.

**Workaround:** This issue can be resolved by software where the iRTC Alarm feature disables the DST after the fallback event occurs. Then re-enables the DST after the iRTC passes the next hour (e.g after 16:00:00). Make sure the DST is re-enabled before the next DST event occurs.

Note that this workaround requires MCU to wake up when DST fallback event occurs once a year. Therefore, in addition to have power present at VBAT pin, it is also required to have power present at MCU VDD pins when DST fallback occurs.

Following is an example of the workaround:

15:59:59 -> 1st alarm (counter ==0)

- 15:59:59 falls back to 15:00:00
- In Alarm interrupt service routine :
  - Update software counter = 1 ;
  - Re-configure next alarm to a time before the next 15:59:59 roll over. In this example we keep the alarm time same as the first one at 15:59:59.

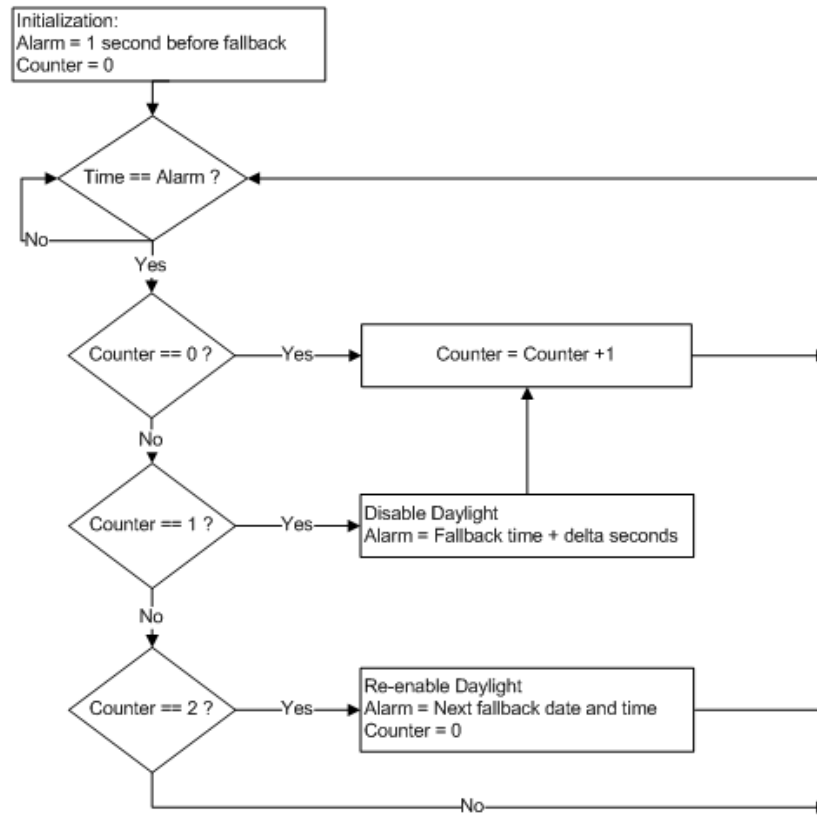
15:59:59 -> 2nd alarm (counter ==1)

- In Alarm interrupt service routine:
  - Disable DST feature. This allows 15:59:59 to correctly roll to 16:00:00
  - Re-configure next alarm to a time after 16:00:00. We recommend choosing a time long enough to account for alarm interrupt service routine execution time. Testing showed that with 15 seconds after roll over time is a safe delay. In this example the next alarm is set to 16:00:15
  - Set software counter = 2;

16:00:15 -> 3rd alarm (counter ==2)

- Re-enable DST feature so that the next DST event can occur.
- Re-configure alarm to the next DST fallback date and time
- Reset counter (counter = 0)

See following flow chart for the workaround example described above:



## **How to Reach Us:**

### **Home Page:**

[www.freescale.com](http://www.freescale.com)

### **Web Support:**

<http://www.freescale.com/support>

### **USA/Europe or Locations Not Listed:**

Freescale Semiconductor  
Technical Information Center, EL516  
2100 East Elliot Road  
Tempe, Arizona 85284  
+1-800-521-6274 or +1-480-768-2130  
[www.freescale.com/support](http://www.freescale.com/support)

### **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)  
[www.freescale.com/support](http://www.freescale.com/support)

### **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](mailto:support.japan@freescale.com)

### **Asia/Pacific:**

Freescale Semiconductor China Ltd.  
Exchange Building 23F  
No. 118 Jianguo Road  
Chaoyang District  
Beijing 100022  
China  
+86 10 5879 8000  
[support.asia@freescale.com](mailto:support.asia@freescale.com)

Information in this document is provided solely to enable system and software implementers to use Freescale Semiconductors 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 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 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 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 claims alleges that Freescale Semiconductor was negligent regarding the design or manufacture of the part.

RoHS-compliant and/or Pb-free versions of Freescale products have the functionality and electrical characteristics as their non-RoHS-complaint 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>.

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

© 2015 Freescale Semiconductor, Inc.