



August 26, 2009

## C8051F52x-53x and C8051F52xA-F53xA Errata

### Errata Status Summary

This document summarizes all known errata with the C8051F52x-F53x and C8051F52xA-F53xA devices.

Errata #	Title	Impact	C8051F52x-53x, C8051F52xA-F53xA
1	VDD Monitor / VDD Regulator Interaction	Minor	Issue Exists
2	Addition of Automotive Qualified Devices	Information	Applies to C8051F52xA-F53xA only

Impact Definition: Each erratum is marked with an impact, as defined below:

- Minor—Workaround exists.
- Major—Errata that do not conform to the data sheet or standard.
- Information—The device behavior is not ideal but acceptable. Typically, the data sheet will be changed to match the device behavior.

### Errata Details

#### 1. Description:

There is an interaction between the VDD Monitor and the Voltage Regulator that causes some devices to be held in reset. The VDD Monitor threshold has a low setting (default) and a high setting. The VDD Monitor threshold setting is persistent after all device resets except for a power-on reset. The Voltage Regulator output is self-calibrated after a device is released from reset.

On the affected devices, the uncalibrated Voltage Regulator output is below the high VDD monitor threshold. On these devices, with the VDD Monitor configured to the high threshold and enabled as a reset source, when a reset occurs, the device is held in reset by the VDD Monitor until a power-on reset. The uncalibrated Voltage Regulator output triggers the VDD Monitor to hold the device in reset, preventing the calibration sequence of the regulator.

**Workaround:****A. Preventing the Issue**

One option to prevent this issue is to not use the high setting for the VDD Monitor in conjunction with the internal regulator. Note that the high setting for the VDD Monitor is required to perform in-application Flash programming. If in-application Flash programming is required, perform the following steps:

1. Disable the VDD Monitor as a reset source in SFR RSTSRC.
2. Configure the VDD Monitor to the high threshold using SFR VDDMON.
3. Wait for the required VDD monitor stabilization time.
4. Check the VDDSTAT bit in VDDMON to confirm that the VDD voltage is above the threshold.
5. If the VDD voltage is above the threshold, enable the VDD Monitor as a reset source in RSTSRC.
6. Perform the Flash write/erase.
7. Disable the VDD Monitor as a reset source.
8. Configure the VDD Monitor to the low threshold.
9. Re-enable the VDD Monitor as a reset source in RSTSRC.

Contact MCU Applications at [www.silabs.com/support](http://www.silabs.com/support) for example firmware.

The issue is also preventable by using an external voltage source for VDD instead of the output of the Voltage Regulator. When an external voltage source is used for VDD, firmware should disable the internal voltage regulator. In this configuration, it is safe to set the VDD Monitor to the high threshold.

**B. Recovering a Device**

On the affected devices, it is not possible to connect to or reprogram the MCU using the Silicon Labs IDE once firmware is loaded that sets the VDD monitor to the high threshold. The Silicon Labs IDE C2 connection sequence first resets device before putting the device into the debug state. This C2 reset triggers the issue, preventing the IDE from connecting to the device.

To recover a device that will not connect to the Silicon Labs IDE due to this issue, override the regulator using an external voltage supply. Use an external voltage supply that is higher than the high VDD monitor threshold. This will prevent the supply monitor from holding the device in reset, and the Silicon Labs IDE can then connect to the device and erase code space using the Tools → Erase Code Space menu option.

Another option to recover a device is to use the Silicon Labs Device Erase program. Contact MCU Applications at [www.silabs.com/support](http://www.silabs.com/support) to obtain the program.

**Resolution:**

The next revision of the C8051F52x/52xA/53x/F53xA data sheet will include details of the issue and the workarounds. The current version of the data sheet is Revision 1.0.

## 2. Description:

New part numbers are now available for order from the C8051F52xA/53xA family of the devices. The new part numbers include an –AT or –AM suffix.

AM and AT numbered devices receive full automotive quality production status, including AEC-Q100 qualification, registration with International Material Data System (IMDS), and Part Production Approval Process (PPAP) documentation. PPAP documentation is available at [www.silabs.com](http://www.silabs.com) with a registered and NDA approved user account. Contact your local Silicon Labs Sales Representative to get proper website access to download the PPAP documentation.

The full list of new devices is as follows:

C8051F520A-AM	C8051F530A-AM	C8051F530A-AT
C8051F521A-AM	C8051F531A-AM	C8051F531A-AT
C8051F523A-AM	C8051F533A-AM	C8051F533A-AT
C8051F524A-AM	C8051F534A-AM	C8051F534A-AT
C8051F526A-AM	C8051F536A-AM	C8051F536A-AT
C8051F527A-AM	C8051F537A-AM	C8051F537A-AT

The new devices have the same pinout and package, and are functionally and electrically equivalent to the corresponding –IM or –IT devices currently documented in the data sheet. For example, the C8051F520A-AM is equivalent to the C8051F520A-IM, except for the additional automotive qualification.

### Resolution:

The next revision of the C8051F52x/52xA/53x/F53xA data sheet will include information regarding the Automotive-qualified parts. The current version of the data sheet is Revision 1.0.