

# MC33689D

## Introduction

This errata sheet applies to the following device:

- MC33689D SBCLIN (System Basis Chip with LIN Transceiver)

## Device Identification

All standard devices are marked with a device identification and build information code. The first line written on the package indicates the Part Number and the second line the Date Code.

- MC33689DDWB is the part marking for this device

## Device Build Information / Date Code

Device markings indicate build information containing the week and year of manufacture. The date is coded with the last four characters of the seven character build information code (e.g. "AWL0529"). The date is coded as four numerical digits where the first two digits indicate the year and the last two digits indicate the week. For instance, the date code "0529" indicates the 29th week of the year 2005.

## Device Part Number Prefixes

Some device samples are marked with a **PC** prefix. A **PC** prefix indicates a prototype device which has undergone basic testing only. After full characterization and qualification, devices will be marked with the **MC** prefix.

## MC33689D Errata - LIN Dominant Issue

PC33689DDWB or MC33689DDWB are the part numbers for the device errata, **regardless of the date code.**

### Description

The LIN Physical Layer Specification which is part of the LIN Specification Package 2.0 defines the  $V_{SUP}$  supply voltage range between 7V and 18V ( $V_{BAT}$  range 8V to 18V). On this device, the LIN bus output can get stuck in dominant state if both conditions are present:

1. The supply voltage  $V_{SUP}$  is below 5.5V and above 4.7V ( $5.5V > V_{SUP} > 4.7V$ ).
2. The device is in Normal Mode and the transceiver is forcing the LIN to dominant state (TXD=0V).

If  $V_{SUP}$  drops further below 4.7V (Reset threshold typical value), the device will reset and the LIN bus goes in recessive state or if the  $V_{SUP}$  is increasing above 5.5V the LIN bus goes also in recessive state (Normal Operation).

### Workaround

#### Avoid stuck condition

To avoid the transceiver to transmit data in the critical  $V_{SUP}$  area (5.5V to 4.7V), the Low Voltage Interrupt of the Micro Controller can be used to detect the critical  $V_{SUP}$  area and to disable (by software) the transmission.

To reenble the transmission, the Low Voltage Flag can be used to detect that the supply voltage is back high enough.

#### Remove a stuck condition

To avoid having the stuck condition present for a longer period of time, it's possible to detect the dominant state by monitoring the RXD signal. The stuck dominant can be removed by entering the device in Sleep or Stop Mode or by preventing the TXD communication transmission (TXD stays in Recessive State) during the  $V_{SUP}$  critical voltage range.

## MC33689D Errata - Low Voltage Reset Weakness

PC33689DDWB or MC33689DDWB are the part numbers for device errata. The **date code to consider starts** the “0428” that means all devices manufactured the week 28 of the year 2004 and after are impacted by this errata.

### **Description**

Sometimes, during a power up sequence, VS1/VS2 increase from 0V to nominal value and as soon as Vdd reaches 3.2V, the Reset terminal rises to 3.2V and then returns low again after few a mV.

The same behavior can be observed for a power down: when Vs1/Vs2 reaches the reset threshold (4.7V typically), the Reset pin goes low and when Vdd reaches 3.2V, the Reset pin goes to 3.2V and goes low again after few a mV.

### **Workaround**

Enable the microcontroller LVI (Low Voltage Inhibit). The microcontroller should be configured to work with the 3V parameters specification until 5V LVI trippoint is enabled.

The behavior described above is dependent on some dynamic conditions like power up/down slew rate on Vbat line. Therefore, the following recommendations could suppress these erroneous reset pulses:

1. Use a filtering capacitor value on the regulator output up to 10 $\mu$ F
2. Do not add external pull up resistor on the reset line

## **How to Reach Us:**

**Home Page:**  
[www.freescale.com](http://www.freescale.com)

**E-mail:**  
[support@freescale.com](mailto: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](mailto: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](mailto: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](mailto: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](mailto: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](mailto:LDCForFreescaleSemiconductor@hibbertgroup.com)

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

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. 2005. All rights reserved.