



The following document contains information on Cypress products. The document has the series name, product name, and ordering part numbering with the prefix “MB”. However, Cypress will offer these products to new and existing customers with the series name, product name, and ordering part number with the prefix “CY”.

How to Check the Ordering Part Number

1. Go to www.cypress.com/pcn.
2. Enter the keyword (for example, ordering part number) in the **SEARCH PCNS** field and click **Apply**.
3. Click the corresponding title from the search results.
4. Download the Affected Parts List file, which has details of all changes

For More Information

Please contact your local sales office for additional information about Cypress products and solutions.

About Cypress

Cypress is the leader in advanced embedded system solutions for the world's most innovative automotive, industrial, smart home appliances, consumer electronics and medical products. Cypress' microcontrollers, analog ICs, wireless and USB-based connectivity solutions and reliable, high-performance memories help engineers design differentiated products and get them to market first. Cypress is committed to providing customers with the best support and development resources on the planet enabling them to disrupt markets by creating new product categories in record time. To learn more, go to www.cypress.com.

F²MC-8FX Family MB95200H/210H Series Low-Voltage Detection Reset Circuit

This application note describes the function and operation of low-voltage detection reset circuit. The configuration, pins, and operation of low-voltage detection reset circuit are introduced in this document.

1 Introduction

The Application Note describes the function and operation of low-voltage detection reset circuit. The configuration, pins, and operation of low-voltage detection reset circuit are introduced in this manual.

2 Feature

This chapter explains the electrical characteristics and block diagram.

This circuit monitors power supply voltage and generates reset signal if the voltage drops below the detection voltage level.

The functions of low-voltage detection reset circuit are as follow:

- Avoid the Power Down;
- Detect low voltage;
- Reset the MCU;
- Output reset signal to external pin.

So we don't need to apply a voltage monitoring IC to the external circuits.

2.1 Electrical Characteristics

The electrical characteristics related to low-voltage detection are as follows.

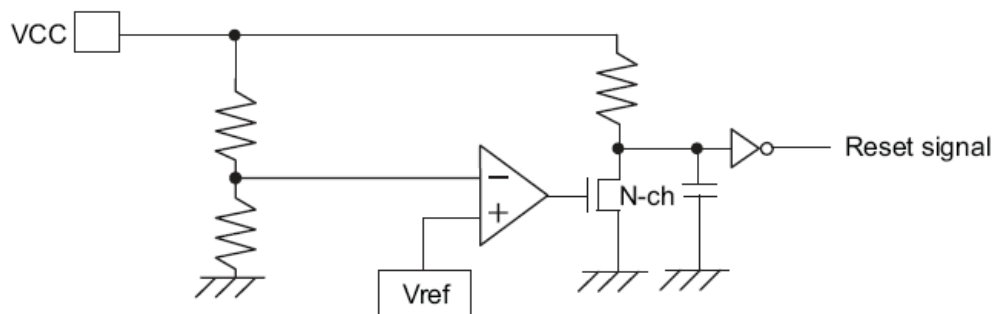
Table 1. Electrical Characteristics related to Low-voltage Detection

| Parameter | Symbol | Value | | | Unit | Remarks |
|---|-----------|-------|------|------|---------|---|
| | | Min | Typ | Max | | |
| Release voltage | V_{DL+} | 2.52 | 2.7 | 2.88 | V | At power supply rise |
| Detection voltage | V_{DL-} | 2.42 | 2.6 | 2.78 | V | At power supply fall |
| Hysteresis width | V_{HYS} | 70 | 100 | — | mV | |
| Power supply start voltage | V_{off} | — | — | 2.3 | V | |
| Power supply end voltage | V_{on} | 4.9 | — | — | V | |
| Power supply voltage change time (at power supply rise) | t_r | 1 | — | — | μ s | Slope of power supply that the reset release signal generates |
| | | — | 3000 | — | μ s | Slope of power supply that the reset release signal generates within the rating (V_{DL+}) |
| Power supply voltage change time (at power supply fall) | t_f | 300 | — | — | μ s | Slope of power supply that the reset detection signal generates |
| | | — | 300 | — | μ s | Slope of power supply that the reset detection signal generates within the rating (V_{DL-}) |
| Reset release delay time | t_{d1} | — | — | 300 | μ s | |
| Reset detection delay time | t_{d2} | — | — | 20 | μ s | |

2.2 Block Diagram

Figure 1 shows block diagram of low-voltage detection reset circuit.

Figure 1. Block Diagram of Low-voltage Detection Reset Circuit



3 Pins Related to Low-voltage Detection Reset Circuit

This chapter explains the pins of low-voltage detection reset circuit.

Pins Related to Low-voltage Detection Reset Circuit

VCC pin

Low-voltage detection reset circuit monitors the voltage applied to Vcc pin.

VSS pin

Vss pin is a GND pin serving as the reference for voltage detection.

RST pin

The low-voltage detection reset signal is output to RST pin inside the microcontroller.

4 Operation of Low-voltage Detection Reset Circuit

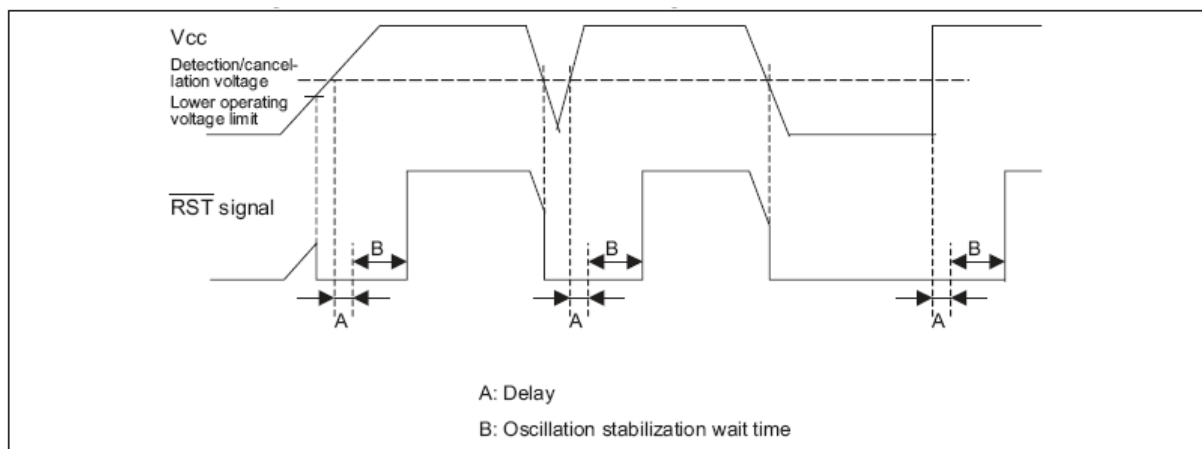
The low-voltage detection reset circuit generates reset signal if the power supply voltage falls below the detection voltage level.

4.1 Operation of Low-voltage Detection Reset Circuit

Low-voltage detection reset circuit generates reset signal if the power supply voltage falls below the detection voltage level. If the voltage is subsequently detected to have been recovered, the circuit outputs reset signal during oscillation stabilization wait time to cancel the reset.

For details on the electrical characteristics, refer to Data Sheet.

Figure 2. Operation of Low-voltage Detection Reset Circuit



5 Notes on Low-voltage Detection Reset Circuit

This chapter shows the notes on Low-voltage detection reset circuit.

The MB5200H/210H series of 8FX-Family has low-voltage detection function, so users should pay attention to following notes.

The low-voltage detection reset circuit remains operating even in standby modes (stop, sleep, sub-clock and watch modes).

Low-voltage detection is compulsorily set to “ON” debug mode, it is higher priority than user option.

There isn't any external mode pin control, so initialize the low-voltage detection state by power-on reset and external reset.

6 Additional Information

For more information on Cypress Semiconductor products, please visit the following website:

www.cypress.com/documentation/application-notes/mb95200-lvd-reset-flag-register

Document History

Document Title: AN205332 - F²MC-8FX Family MB95200H/210H Series Low-Voltage Detection Reset Circuit

Document Number: 002-05332

| Revision | ECN | Orig. of Change | Submission Date | Description of Change |
|----------|---------|-----------------|-----------------|--|
| ** | — | HUAL | 03/20/2008 | Initial release. |
| | | | 07/15/2008 | Modification |
| *A | 5260349 | HUAL | 05/09/2016 | Migrated Spansion Application note from MCU-AN- 500011-E-11 to Cypress format. |

Worldwide Sales and Design Support

Cypress maintains a worldwide network of offices, solution centers, manufacturer's representatives, and distributors. To find the office closest to you, visit us at [Cypress Locations](#).

Products

| | |
|---|--|
| ARM [®] Cortex [®] Microcontrollers | cypress.com/arm |
| Automotive | cypress.com/automotive |
| Clocks & Buffers | cypress.com/clocks |
| Interface | cypress.com/interface |
| Lighting & Power Control | cypress.com/powerpsoc |
| Memory | cypress.com/memory |
| PSoC | cypress.com/psoc |
| Touch Sensing | cypress.com/touch |
| USB Controllers | cypress.com/usb |
| Wireless/RF | cypress.com/wireless |

PSoC[®] Solutions

[PSoC 1](#) | [PSoC 3](#) | [PSoC 4](#) | [PSoC 5LP](#)

Cypress Developer Community

[Forums](#) | [Projects](#) | [Videos](#) | [Blogs](#) | [Training](#) | [Components](#)

Technical Support

cypress.com/support

PSoC is a registered trademark and PSoC Creator is a trademark of Cypress Semiconductor Corporation. All other trademarks or registered trademarks referenced herein are the property of their respective owners.



Cypress Semiconductor Phone : 408-943-2600
198 Champion Court Fax : 408-943-4730
San Jose, CA 95134-1709 Website : www.cypress.com

© Cypress Semiconductor Corporation, 2008-2016. This document is the property of Cypress Semiconductor Corporation and its subsidiaries, including Spansion LLC ("Cypress"). This document, including any software or firmware included or referenced in this document ("Software"), is owned by Cypress under the intellectual property laws and treaties of the United States and other countries worldwide. Cypress reserves all rights under such laws and treaties and does not, except as specifically stated in this paragraph, grant any license under its patents, copyrights, trademarks, or other intellectual property rights. If the Software is not accompanied by a license agreement and you do not otherwise have a written agreement with Cypress governing the use of the Software, then Cypress hereby grants you a personal, non-exclusive, nontransferable license (without the right to sublicense) (1) under its copyright rights in the Software (a) for Software provided in source code form, to modify and reproduce the Software solely for use with Cypress hardware products, only internally within your organization, and (b) to distribute the Software in binary code form externally to end users (either directly or indirectly through resellers and distributors), solely for use on Cypress hardware product units, and (2) under those claims of Cypress's patents that are infringed by the Software (as provided by Cypress, unmodified) to make, use, distribute, and import the Software solely for use with Cypress hardware products. Any other use, reproduction, modification, translation, or compilation of the Software is prohibited.

TO THE EXTENT PERMITTED BY APPLICABLE LAW, CYPRESS MAKES NO WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, WITH REGARD TO THIS DOCUMENT OR ANY SOFTWARE OR ACCOMPANYING HARDWARE, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. To the extent permitted by applicable law, Cypress reserves the right to make changes to this document without further notice. Cypress does not assume any liability arising out of the application or use of any product or circuit described in this document. Any information provided in this document, including any sample design information or programming code, is provided only for reference purposes. It is the responsibility of the user of this document to properly design, program, and test the functionality and safety of any application made of this information and any resulting product. Cypress products are not designed, intended, or authorized for use as critical components in systems designed or intended for the operation of weapons, weapons systems, nuclear installations, life-support devices or systems, other medical devices or systems (including resuscitation equipment and surgical implants), pollution control or hazardous substances management, or other uses where the failure of the device or system could cause personal injury, death, or property damage ("Unintended Uses"). A critical component is any component of a device or system whose failure to perform can be reasonably expected to cause the failure of the device or system, or to affect its safety or effectiveness. Cypress is not liable, in whole or in part, and you shall and hereby do release Cypress from any claim, damage, or other liability arising from or related to all Unintended Uses of Cypress products. You shall indemnify and hold Cypress harmless from and against all claims, costs, damages, and other liabilities, including claims for personal injury or death, arising from or related to any Unintended Uses of Cypress products.

Cypress, the Cypress logo, Spansion, the Spansion logo, and combinations thereof, PSoC, CapSense, EZ-USB, F-RAM, and Traveo are trademarks or registered trademarks of Cypress in the United States and other countries. For a more complete list of Cypress trademarks, visit cypress.com. Other names and brands may be claimed as property of their respective owners.