

Summary

All XC5200, XC4000, XC3000, and newer 0.8 μ XC2000 devices have internal voltage monitoring. A simple circuit provides the equivalent feature for older XC2000 devices.

Xilinx Family

XC2000

Demonstrates

Voltage monitoring

Introduction

All Xilinx FPGA devices—including XC2000 devices built using 0.8 μ technology—have an internal voltage monitoring circuit. This circuit assures proper start-up after V_{CC} has returned from a voltage drop below 3 V, **even if V_{CC} did not drop all the way to ground.**

Newer XC2000 Devices Include Monitor

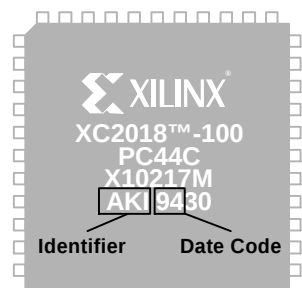


Figure 1. Top marking.

A voltage monitor is included in all XC2000 devices top-marked with a lot code identifier starting with 'AKI,' 'CKI,' or a date code of '95 or later—see Figure 1. The voltage monitoring circuit was added as part of the re-design for the 0.8 μ process.

Voltage Monitor for Older XC2000 Devices

For applications using non-0.8 μ XC2000 product and requiring voltage monitoring, a small amount of additional logic will detect low V_{CC} and will apply the appropriate start-up conditions. The condition required during start-up or reprogram are detailed on pages 2-198 and 2-208 in **The Programmable Logic Data Book, 1994.**

The complete monitoring circuit is shown in Figure 2. It is not sufficient to keep $\overline{\text{RESET}}$ Low while V_{CC} is detected as being Low. A High-to-Low transition on $\overline{\text{RESET}}$, while $\overline{\text{DONE}}$ is Low, is required.

The $\overline{\text{DONE}}/\overline{\text{PROG}}$ pin is permanently grounded. This makes the $\overline{\text{RESET}}$ pin a RECONFIGURE input. Consequently, the $\overline{\text{RESET}}$ pin can no longer be used as a global reset for user logic. However, automatic reset occurs during any start-up or reconfiguration.

Whenever V_{CC} drops below ~ 4.5 V, the V_{CC} monitoring circuit generates a Low signal. This signal activates an oscillator circuit built from an 74HC00. The oscillator applies alternating High and Low levels of 20 μ s duration to the $\overline{\text{RESET}}$ input.

Once V_{CC} exceeds ~ 4 V, then the monitor output goes High. If the FPGA's $\overline{\text{RESET}}$ input is also High, then the leftmost NAND goes Low, which immediately stops the oscillator. This assures that the XC2000 starts its configuration process properly when V_{CC} returns to an acceptable value as detected by the voltage monitor.

Table 1. Parts List for Voltage Monitor.

Part Number	Quantity
Three-terminal reset monitor. Maxim MAX809CPA-M (8-pin DIP) or Dallas DS1233-15 (TO-92).	1
74HC00 quad-NAND	1
10 K Ω resistor	2
1,000 pF capacitor	1

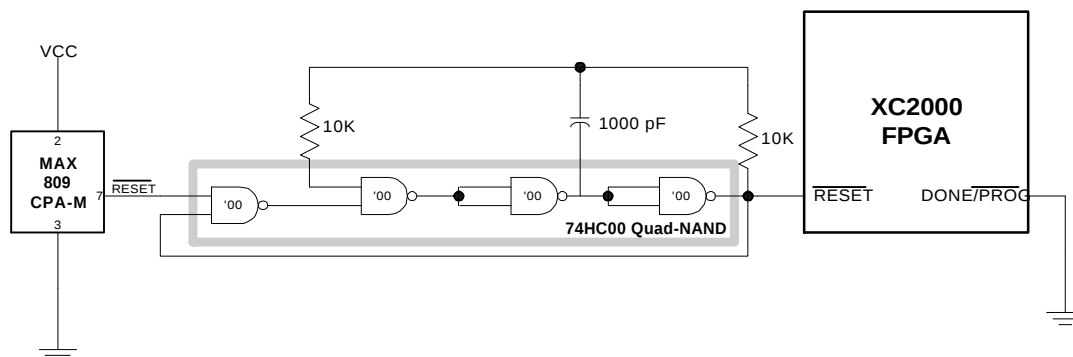


Figure 2. Simple circuit to add voltage monitoring for older XC2000 devices (pre-0.8 μ technology).

North America

Corporate Headquarters

Xilinx, Inc.
2100 Logic Drive
San Jose, CA 95124
U.S.A.

Tel: 1+(408) 559-7778
FAX: 1+(408) 559-7114

Northern California

Xilinx, Inc.
3235 Kifer Road
Suite 320
Santa Clara, CA 95051

Tel: (408) 245-1361
FAX: (408) 245-0517

Southern California

Xilinx, Inc.
15615 Alton Parkway
Suite 280
Irvine, CA 92718

Tel: (714) 727-0780
FAX: (714) 727-3128

New Hampshire

Xilinx, Inc.
61 Spit Brook Road
Nashua, NH 03060

Tel: (603) 891-1096
FAX: (603) 891-0890

Pennsylvania

Xilinx, Inc.
65 Valley Stream Parkway
Suite 140
Malvern, PA 19355

Tel: (215) 296-8302
FAX: (215) 296-8378

Texas

Xilinx, Inc.
4100 McEwen
Suite 237
Dallas, TX 75244

Tel: (214) 960-1043
FAX: (214) 960-0927

Illinois

Xilinx, Inc.
939 N. Plum Grove Road
Suite H
Schaumburg, IL 60173

Tel: (708) 605-1972
FAX: (708) 605-1976

North Carolina

Xilinx, Inc.
5952 Six Forks Road
Raleigh, NC 27609

Tel: (919) 846-3922
FAX: (919) 846-8316

Europe

United Kingdom

Xilinx, Ltd.
Suite 1B, Cobb House
Oyster Lane, Byfleet
Surry KT14 7DU
UNITED KINGDOM

Tel: (44) 932-349401
FAX: (44) 932-349499

France

Xilinx Sarl
Espace Jouy Technology
21, rue Albert Calmette, Bt. C
78353 Jouy en Josas Cedex
FRANCE

Tel: (33) 1-34-63-01-01
FAX: (33) 1-34-63-01-09

Germany

Xilinx, GmbH
Dorfstr. 1
85609 Aschheim
München
GERMANY

Tel: (49) 89-904-5024
FAX: (49) 89-904-4748

Japan

Xilinx, K.K.
Daini-Nagaoka Bldg. 2F
2-8-5, Hatchobori Chuo-ku
Tokyo 104
JAPAN

Tel: (03) 3297-9191
FAX: (03) 3297-9189

Asia Pacific

Hong Kong

Xilinx Asia Pacific
Unit No. 2318-2309
Tower 1, Metroplaza
Hing Fong Road
Kwai Fong, N.T.
HONG KONG

Tel: (852) 410-2717
FAX: (852) 418-1600
E-mail: hongkong@xilinx.com



The Programmable Logic CompanySM