

SPI™ 25xx080/160 Mode 1,1 Write Operation

Author: Shannon Poulin
Microchip Technology Inc.

INTRODUCTION

The early revision of Microchip's 25xx080 and 25xx160 devices (revision A and B) require a software work around for proper write operation in mode 1,1. Mode 0,0 does NOT require a work around. This issue does not exist in 25xx080 and 25xx160 revision C silicon. The revision number can be found on the outside of a packaged part. It is the middle letter of the three letter string following the package type.

Mode 0,0 and 1,1 indicate that an SPI slave device latches serial data in on the rising edge of clock and out after the falling edge of clock. Mode 0,1 and 1,0 SPI devices would latch data in on the falling edge of clock and out after the rising edge of clock.

Reading a 25xx080 or 25xx160 devices do not require any software adjustments whether it is read in mode 0,0 or 1,1. However, for revision A or B silicon to properly initiate a write, the clock line must be low, when raising chip select ($\overline{CS}$) for the write cycle to begin. In mode 0,0 the polarity of the clock is defined as low, and the clock

idles low when not shifting data in or out. In mode 1,1, the polarity of the clock is defined as high, and the clock idles high when not shifting data in or out.

Figure 1 depicts a write timing diagram. It can be seen that for mode 0,0 operation, the clock line is low when $\overline{CS}$ is brought high to start the write cycle timer. The write will be completed successfully in this case.

The dashed lines in Figure 1 also depict the state of the clock in mode 1,1. The drawing shows that the clock line will be high when $\overline{CS}$ is raised. This will not start the write cycle timer, and the part will not write successfully.

Figure 2 shows the timing necessary for proper implementation of mode 1,1 writes. The following steps should be taken to write properly in mode 1,1:

1. Load and send the write instruction.
2. Load and send the address.
3. Load and send the data.
4. **Lower the clock line.**
5. Raise chip select to start a write.
6. **Raise the clock line.**

The **bold** indicates the extra steps necessary to properly implement mode 1,1 operation on revision A or B silicon. The write cycle timer will begin when the chip select line is raised.

FIGURE 1: NORMAL WRITE OPERATION

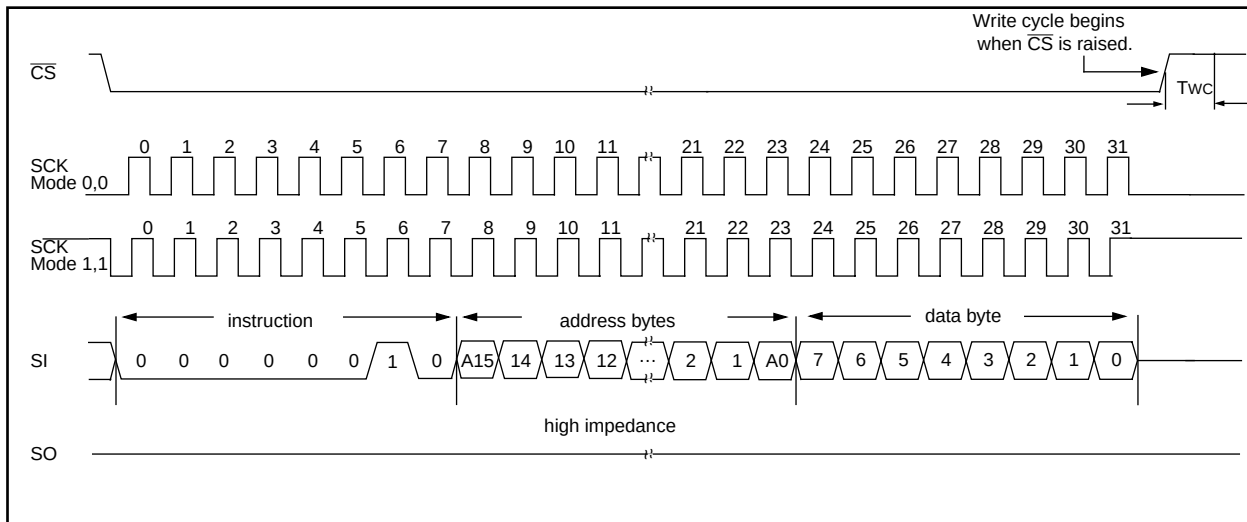
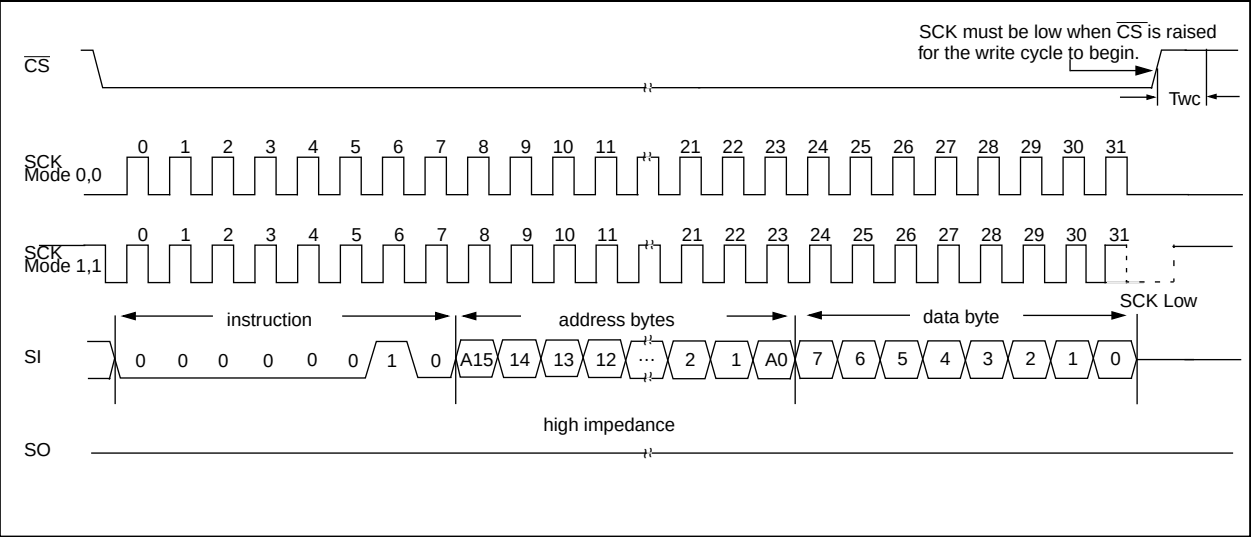


FIGURE 2: MODIFIED WRITE OPERATION



NOTES:



MICROCHIP

WORLDWIDE SALES & SERVICE

AMERICAS

Corporate Office

Microchip Technology Inc.
2355 West Chandler Blvd.
Chandler, AZ 85224-6199
Tel: 602-786-7200 Fax: 602-786-7277
Technical Support: 602 786-7627
Web: <http://www.microchip.com>

Atlanta

Microchip Technology Inc.
500 Sugar Mill Road, Suite 200B
Atlanta, GA 30350
Tel: 770-640-0034 Fax: 770-640-0307

Boston

Microchip Technology Inc.
5 Mount Royal Avenue
Marlborough, MA 01752
Tel: 508-480-9990 Fax: 508-480-8575

Chicago

Microchip Technology Inc.
333 Pierce Road, Suite 180
Itasca, IL 60143
Tel: 630-285-0071 Fax: 630-285-0075

Dallas

Microchip Technology Inc.
14651 Dallas Parkway, Suite 816
Dallas, TX 75240-8809
Tel: 972-991-7177 Fax: 972-991-8588

Dayton

Microchip Technology Inc.
Two Prestige Place, Suite 150
Miamisburg, OH 45342
Tel: 937-291-1654 Fax: 937-291-9175

Los Angeles

Microchip Technology Inc.
18201 Von Karman, Suite 1090
Irvine, CA 92612
Tel: 714-263-1888 Fax: 714-263-1338

New York

Microchip Technology Inc.
150 Motor Parkway, Suite 416
Hauppauge, NY 11788
Tel: 516-273-5305 Fax: 516-273-5335

San Jose

Microchip Technology Inc.
2107 North First Street, Suite 590
San Jose, CA 95131
Tel: 408-436-7950 Fax: 408-436-7955

Toronto

Microchip Technology Inc.
5925 Airport Road, Suite 200
Mississauga, Ontario L4V 1W1, Canada
Tel: 905-405-6279 Fax: 905-405-6253

ASIA/PACIFIC

Hong Kong

Microchip Asia Pacific
RM 3801B, Tower Two
Metroplaza
223 Hing Fong Road
Kwai Fong, N.T., Hong Kong
Tel: 852-2-401-1200 Fax: 852-2-401-3431

India

Microchip Technology Inc.
India Liaison Office
No. 6, Legacy, Convent Road
Bangalore 560 025, India
Tel: 91-80-229-4036 Fax: 91-80-559-9840

Korea

Microchip Technology Korea
168-1, Youngbo Bldg. 3 Floor
Samsung-Dong, Kangnam-Ku
Seoul, Korea
Tel: 82-2-554-7200 Fax: 82-2-558-5934

Shanghai

Microchip Technology
RM 406 Shanghai Golden Bridge Bldg.
2077 Yan'an Road West, Hong Qiao District
Shanghai, PRC 200335
Tel: 86-21-6275-5700
Fax: 86 21-6275-5060

Singapore

Microchip Technology Taiwan
Singapore Branch
200 Middle Road
#10-03 Prime Centre
Singapore 188980
Tel: 65-334-8870 Fax: 65-334-8850

Taiwan, R.O.C

Microchip Technology Taiwan
10F-1C 207
Tung Hua North Road
Taipei, Taiwan, ROC
Tel: 886 2-717-7175 Fax: 886-2-545-0139

EUROPE

United Kingdom

Arizona Microchip Technology Ltd.
Unit 6, The Courtyard
Meadow Bank, Furlong Road
Bourne End, Buckinghamshire SL8 5AJ
Tel: 44-1628-851077 Fax: 44-1628-850259

France

Arizona Microchip Technology SARL
Zone Industrielle de la Bonde
2 Rue du Buisson aux Fraises
91300 Massy, France
Tel: 33-1-69-53-63-20 Fax: 33-1-69-30-90-79

Germany

Arizona Microchip Technology GmbH
Gustav-Heinemann-Ring 125
D-81739 München, Germany
Tel: 49-89-627-144 0 Fax: 49-89-627-144-44

Italy

Arizona Microchip Technology SRL
Centro Direzionale Colleoni
Palazzo Taurus 1 V. Le Colleoni 1
20041 Agrate Brianza
Milan, Italy
Tel: 39-39-6899939 Fax: 39-39-6899883

JAPAN

Microchip Technology Intl. Inc.
Benex S-1 6F
3-18-20, Shinyokohama
Kohoku-Ku, Yokohama-shi
Kanagawa 222 Japan
Tel: 81-45-471- 6166 Fax: 81-45-471-6122

7/29/97

