

Interfacing AT93CXX Serial EEPROMs with AT89CX051 Microcontrollers

Serial memory devices offer significant advantages over parallel devices in applications where lower data transfer rates are acceptable. In addition to requiring less board space, serial devices allow microcontroller I/O pins to be conserved. This is especially valuable when adding external memory to low pin count microcontrollers such as the Atmel AT89C1051 and AT89C2051.

This application note presents a suite of software routines which may be incorporated into a user's application to allow AT89CX051 microcontrollers to read and write AT93CXX serial EEPROMs. All seven AT93CXX device functions are supported: read, write, write all, erase, erase all, erase/write enable and erase/write disable. The routines are general purpose, supporting both eight-bit and sixteen-bit accesses to all members of the 93CXX family. In addition, both 3-wire and 4-wire configurations are supported.

The AT93CXX may be connected to the AT89CX051 microcontroller in either a 3-

wire (Figure 1) or 4-wire (Figure 2) configuration. In the 3-wire configuration, the EEPROM serial data in (DI) and serial data out (DO) pins are both connected to the same microcontroller I/O pin, thereby saving a pin. This is possible because the microcontroller I/O pins can be dynamically reprogrammed as input or output.

Note the strapping of the AT93CXX ORG pins shown in Figure 1 and Figure 2. The ORG (internal organization) pin selects 8-bit data when grounded and 16-bit data when floating or tied to V_{CC} . The ORG pin connections shown in the figures are for illustration only; 8-bit or 16-bit data may be selected in either the 3-wire or 4-wire configuration.

The software for this application may be obtained by downloading from Atmel's Web Site or BBS. Consult the comment block at the beginning of the source code file for detailed information on features and operation.



Web Site: <http://www.atmel.com>

BBS: 1-(408) 436-4309



Interfacing 93CXX Serial EEPROMs

Application Note

Rev. 0521C-10/98



Figure 1. 3-Wire Configuration

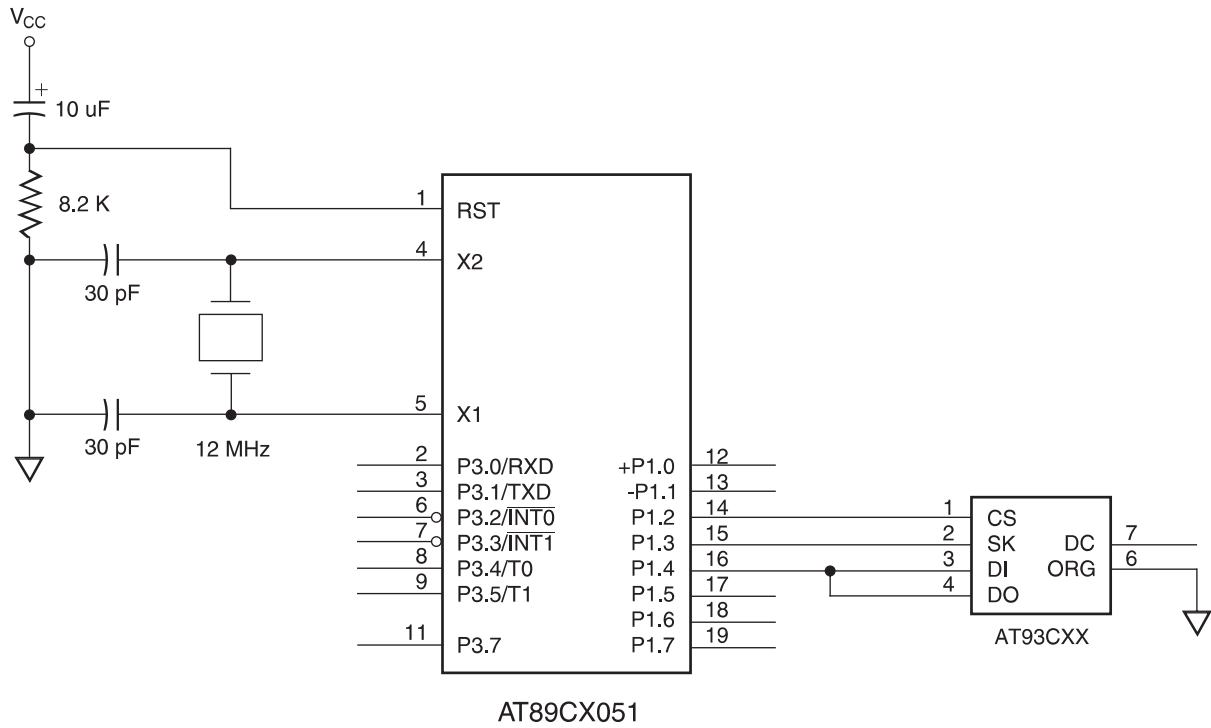
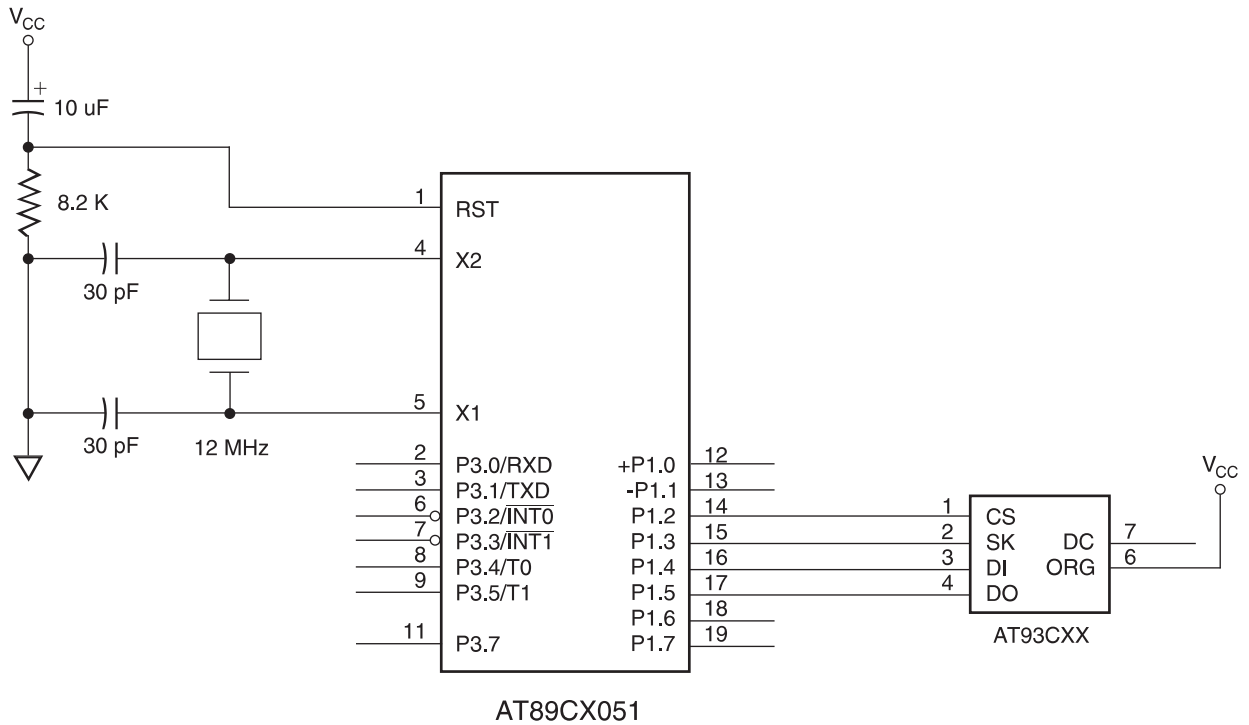


Figure 2. Typical Circuit Configuration





Atmel Headquarters

Corporate Headquarters

2325 Orchard Parkway
San Jose, CA 95131
TEL (408) 441-0311
FAX (408) 487-2600

Europe

Atmel U.K., Ltd.
Coliseum Business Centre
Riverside Way
Camberley, Surrey GU15 3YL
England
TEL (44) 1276-686677
FAX (44) 1276-686697

Asia

Atmel Asia, Ltd.
Room 1219
Chinachem Golden Plaza
77 Mody Road
Tsimshatsui East
Kowloon, Hong Kong
TEL (852) 27219778
FAX (852) 27221369

Japan

Atmel Japan K.K.
Tonetsu Shinkawa Bldg., 9F
1-24-8 Shinkawa
Chuo-ku, Tokyo 104-0033
Japan
TEL (81) 3-3523-3551
FAX (81) 3-3523-7581

Atmel Operations

Atmel Colorado Springs

1150 E. Cheyenne Mtn. Blvd.
Colorado Springs, CO 80906
TEL (719) 576-3300
FAX (719) 540-1759

Atmel Rousset

Zone Industrielle
13106 Rousset Cedex, France
TEL (33) 4 42 53 60 00
FAX (33) 4 42 53 60 01

Fax-on-Demand

North America:

1-(800) 292-8635

International:

1-(408) 441-0732

e-mail

literature@atmel.com

Web Site

<http://www.atmel.com>

BBS

1-(408) 436-4309

© Atmel Corporation 1998.

Atmel Corporation makes no warranty for the use of its products, other than those expressly contained in the Company's standard warranty which is detailed in Atmel's Terms and Conditions located on the Company's website. The Company assumes no responsibility for any errors which may appear in this document, reserves the right to change devices or specifications detailed herein at any time without notice, and does not make any commitment to update the information contained herein. No licenses to patents or other intellectual property of Atmel are granted by the Company in connection with the sale of Atmel products, expressly or by implication. Atmel's products are not authorized for use as critical components in life support devices or systems.

Marks bearing ® and/or ™ are registered trademarks and trademarks of Atmel Corporation.

Terms and product names in this document may be trademarks of others.



Printed on recycled paper.

0521C-10/98/xM