SEMTECH

WIRELESS AND SENSING PRODUCTS

XE8000 series

XE8000EV108 Evaluation Board for the XE8806AMI026 and the XE8807AMI026

User Guide

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WIRELESS AND SENSING PRODUCTS

1 General Introduction

1.1 Introduction

This first chapter contains general information that will be useful to know before using the XE8000EV108 with your XE8806AMI026 and XE8807AMI026.

1.2 Highlights

The information you will gain from this chapter:
- About this Guide
- Recommended Reading
- Troubleshooting
- The Semtech Web Site
- Customer Support

1.3 About this Guide

This document describes how to use The XE8000EV108 as an evaluation board to develop and debug programs on the XE8806A and XE8807A microcontrollers in TQFP32 package (the XE8806AMI026 or XE8807AMI026).
The manual Layout is as follows:
- Chapter 2 : Overview and Installation
- Chapter 3 : Electrical specifications and hardware description
- Chapter 4 : Troubleshooting
- Chapter 5 : Schematics

1.4 Documentation Updates

All documentation evolves and this User's Guide is no exception. Since XE8000EV108 and other Semtech tools are constantly evolving to meet customer needs, some tool descriptions may differ from those in this document. Please refer to our web site at www.semtech.com to obtain the latest documentation available.

1.5 Recommended Reading

This user's guide describes how to use The XE8000EV108. Other useful documents are listed below:
- XE8806ADatasheet.
- ProStart II (XE8000MP) users guide
- Semtech Application notes (AN8000.xx).
These can be found on our web site http://www.semtech.com

1.6 Troubleshooting

See Chapter 4 for information on common problems.

1.7 The Semtech Web Site

Semtech provides on line support on the Semtech World Wide Web site. The web site is used by Semtech as a means to make files and information easily available to customers. It is at http://www.semtech.com

1.8 Customer Support

Customers should call their distributor, representative or field application engineer for support. Users of Semtech products can receive assistance through several channels:
- Distributors or Representative, Local Sales Office
- Field Application Engineer (FAE)
- Third party for source code

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2 Overview and installation

2.1 Introduction

This chapter gives you an overview of the XE8000EV108 evaluation board and then explains how to install the system hardware.

2.2 Highlights

The items discussed in this chapter include:
- What is XE8000EV108
- XE8000EV108 components
- How XE8000EV108 helps you
- Installing XE8000EV108 hardware

2.3 What is XE8000EV108

The XE8000EV108 is the evaluation board for XE8806/07A microcontroller packaged in the TQFP32. This board is designed to also be interfaced with the XE8000MP board. Note that the combination of a XE8000MP and any XE8000EVXXX constitutes the ProStart II system. The XE8000EV108 allows the user to access to every pin of the chip, and provides external actuators and indicators such as LEDs and buttons.

2.4 XE8000EV108 components

The XE8000EV108 is delivered separately, with 3 XE8806A and 3 XE8807A samples. However you need to have the XE8000MP to program these samples. Since one XE8000MP fits for the Whole XE8000 family, this allows you to have multiple XE8000EVXXX without having to buy another XE8000MP.
XE8000EV108 packages contents:
- 1 XE8000EV108
- 1 Box
- 3 Samples

2.5 How XE8000EV108 helps you

XE8000EV108 allows you to:
- Create an action on an input port with buttons (note that jumpers can disable this feature)
- Reset the circuit
- See an action on an output port with LED (note that jumpers can disable this feature)
- Store data in an on board I2C EEPROM.
- Interface a RS232 line driver (with the help of the XE8000MP) to the UART peripheral.
- Use an on board 32kHz watch Xtal, or an external clock source.
- Measure the current consumption of the circuit
- Power the board with three different sources :
    - An external power supply.
    - A button type battery.
    - The ProStart II board.
- Create a quick hardware application on an on-board engineering zone space.

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2.6   Installing XE8000EV108 hardware

2.6.1   Placing the chip on the ZIF socket

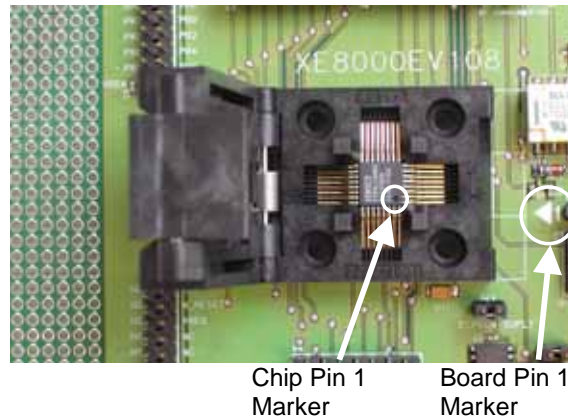The XE8806/07A must be placed with the pin 1 marker aligned with the board pin 1 marker. See picture below:

Chip Pin 1   Board Pin 1
Marker   Marker

Figure 1 : Position of the chip in the ZIF socket

2.6.2   Using an external power supply

To use an external power supply, the user must connect the pins labelled "+" and "-" (see Figure 2) on the header named "EXT POWER" near the battery carrier with a regulated 1.2 to 5.5 Volts power supply.

The switch must be in the "on" position.

Warning this power source is not protected by a fuse! The user should limit the current of the power supply source to prevent damage to board/chip.

2.6.3   Using a button type battery

To power the application with a battery, you may place a button battery of the type cr1620 on the carrier (+ on the top, diameter 16mm height 2.0mm). Since the carrier is flexible, the height can vary a little bit.

Warning this power source is not protected by a fuse!

2.6.4   Using the ProStart II as power supply and programmer

To use the XE8000EV108 with the ProStart II as a power supply or a programmer please refer to ProStart II user guide.

Note : When the ProStart II (XE8000MP) is connected all the other supply sources are bypassed, the default supply of the ProStart II (XE8000MP) is 3.0 Volts and the programming voltage is 5.0 Volts.

2.6.5   Using an external clock source

To use an external clock source, the user must disconnect the on board xtal by removing the br1 jumper, and place their own source on the pin XIN on the header. (see Figure 3)

2.6.6   Measuring the circuit consumption

To measure the consumption of the XE8806A, the user must remove the jumper named br_consumption and place an ammeter between these two points.

2.6.7   How to use the on-board EEPROM

To use the on board EEPROM, please disable the LEDs PB4 and PB5, connect the jumpers br4, br5 & br6. For the software please check on our web site for the technical note TN8000.13 on http://www.semtech.com

3 Electrical specifications and hardware description

3.1 Introduction

This chapter gives you a view of the main characteristics of the XE8000EV108 hardware.
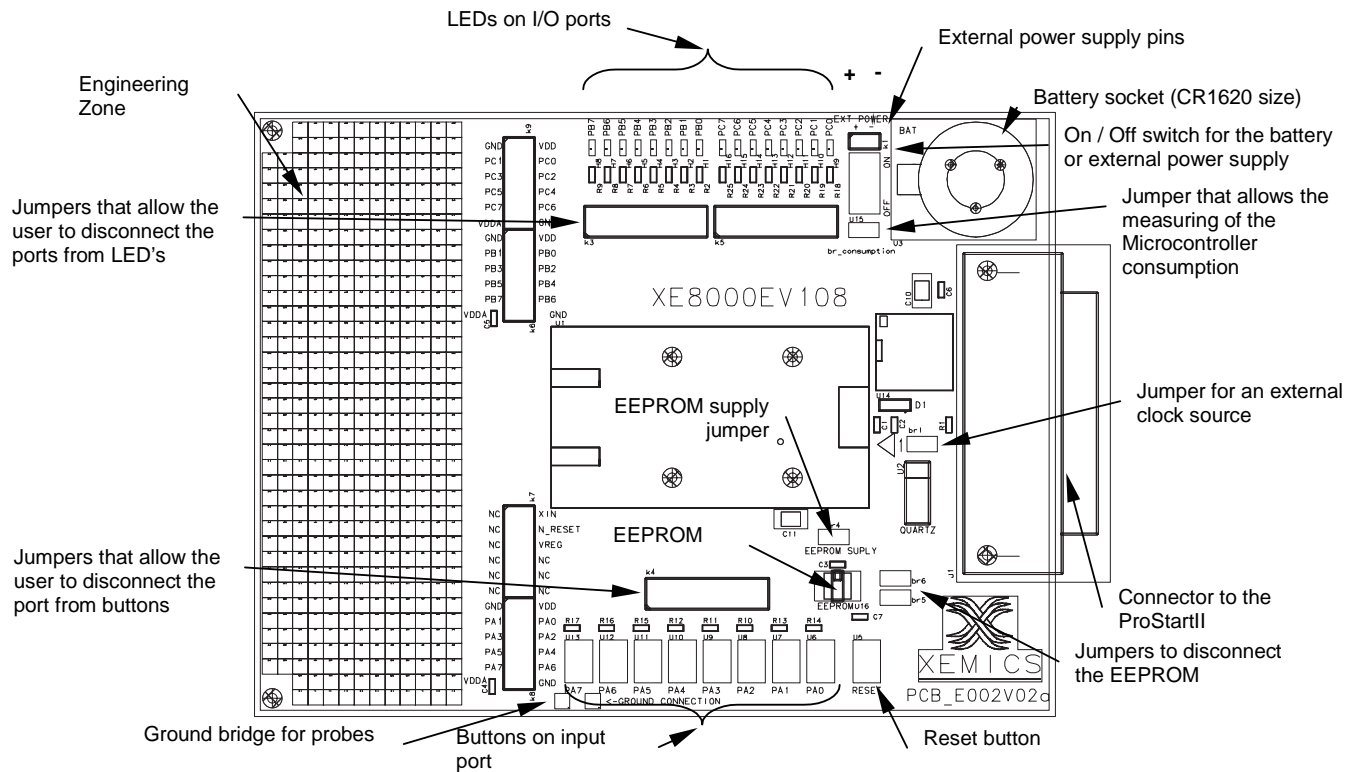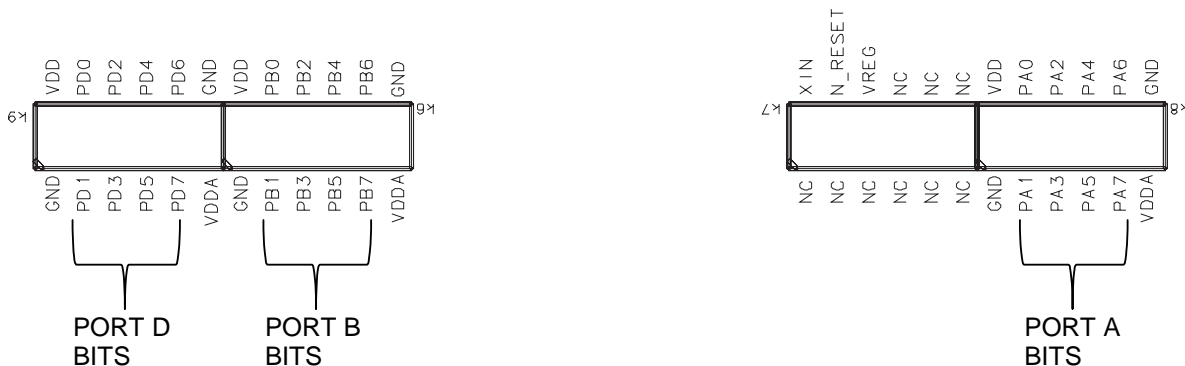
3.2 Hardware layout

Figure 2 : Board elements

Figure 3 Detailed view of the header

4 Troubleshooting

4.1 Introduction
This section is intended to help the XE8000EV108 users to perform basic hardware debugging.

4.2 Highlights
This chapter contains the following points:
- XE8000EV108 functionality
- XE8000EV108 hardware

4.3 XE8000EV108 functionality

Problem 1:   The software that should use the Xtal peripheral seems to be locked.
Possible causes: 1 The jumper br1 is removed
         2 You have disturbed the xin and xout lines with an oscilloscope probe.
         3 The Xtal is not correctly soldered on the board.
         4 The Xtal is damaged.

Problem 2:   The program that should use the EEPROM interface or another I2C device is unable to communicate with them.
Possible causes: 1 The LED jumpers of the ports used are connected
         2 The EEPROM jumpers (br5&6) have been removed
         3 The EEPROM power jumpers has been removed

Problem 3:   When using the ProStart II (XE8000MP) as power supply, the VDDA seems to be unstable.
Possible causes: 1 When the PortB 7 is not used as UART RX and the RS232 line driver creates an output conflict, simply remove the RS232 cable from the ProStart II (XE8000MP) and the RS232 output will go to High Z.
         2 The power consumption of your application is above 500mA

4.4 XE8000EV108 hardware

Problem 1:   The board presents a short circuit between VDDA and GND.
Possible causes: 1 The battery carrier has been damaged and the + contact touches the - : just put a piece of paper between the two contacts
         2 If you are measuring a signal on the board, be careful to not use the ground connection on the headers. There is a more accessible ground near the PA7 button.

Problem 2:   The power supply of the battery is not present on the VDDA line.
Possible causes: 1 The power switch is in the wrong position, to use the battery the switch must be off.
         2 The board is connected to a XE8000MP, in this case user power supplies are bypassed.

Problem 3:   The power supply of the external power supply is not present on the VDDA pin.
Possible causes: 1 The power switch is in the wrong position, to use the external power supply the switch must be on.
         2 The board is connected to a XE8000MP, in this case, user power supplies are bypassed.
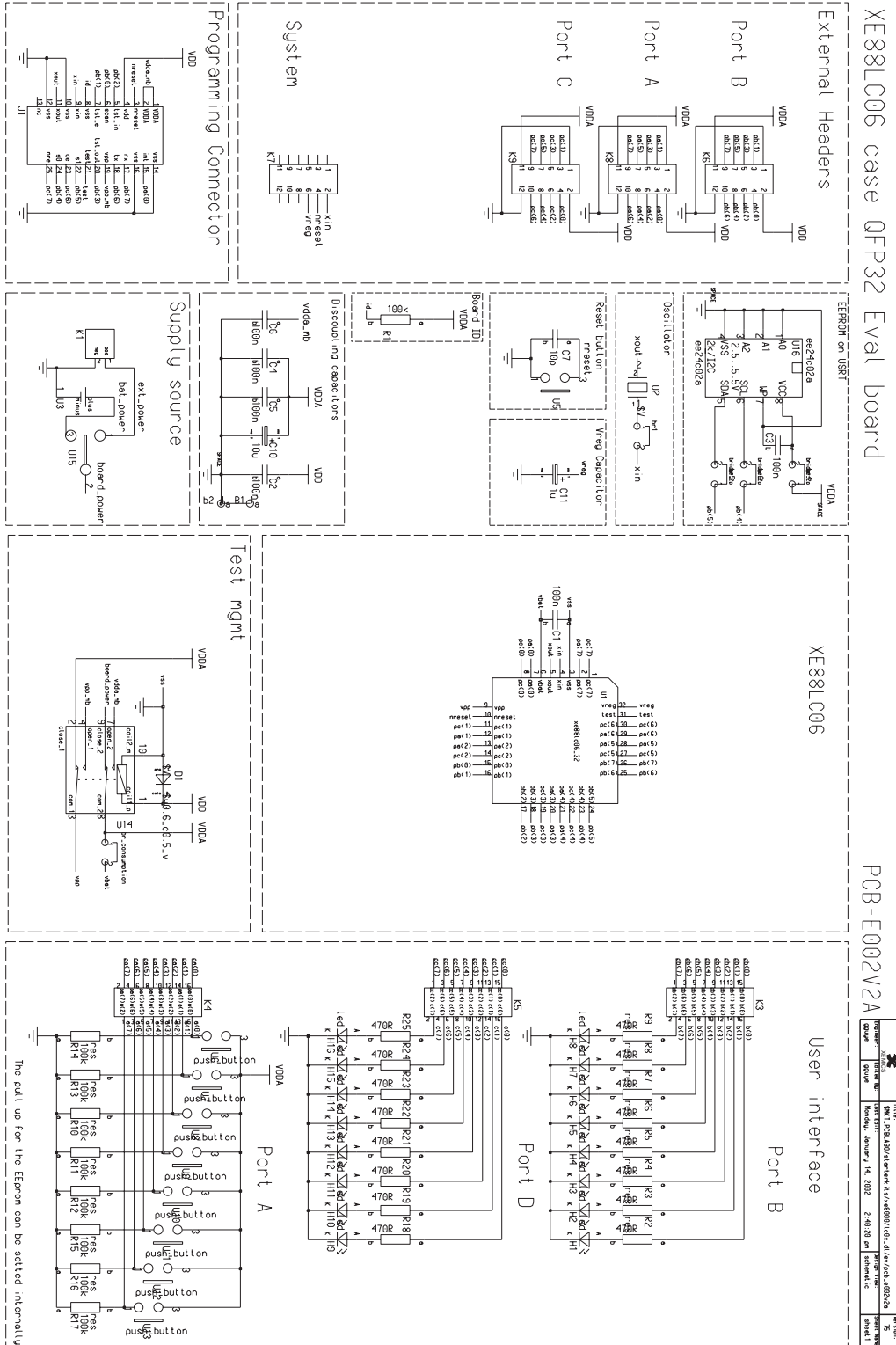
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5   Schematics

Figure 4 XE8000EV108 Schematic

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