

SX8750EVK User Guide

Evaluation Kit for SX8750 - Piezo Actuator drivers

GENERAL DESCRIPTION

SX8750 is a device to drive piezo actuators. It operates from a 3V supply and generate 30V to drive an actuator. No coil or capacitor is used to increase the voltage, minimizing the number of externals and the size of the solution. The output is differential to drive the actuator with positive or negative voltage. The key features are:

- ◆ 2.65 - 3.6 V supply, -16 V to +30 V differential output
- ◆ No coil, no external flying capacitor
- ◆ 2.4 - 4.8 V extended voltage mode
- ◆ I2C controlled 10-bit differential DAC
- ◆ Programmable max positive, max negative voltage and slew rate limitation.

The main applications for this product are:

- ◆ Capacitive actuator control
- ◆ Piezoelectric actuator control.

EVK content

The evaluation kit is composed of the following parts:

- ◆ The evaluation board
- ◆ A USB cable to connect the board to the PC
- ◆ A CDROM with the installation files and the user guide

MINIMAL CONFIGURATION

- ◆ PC with MS Windows 2000/XP
- ◆ USB interface

RECOMMENDED READING

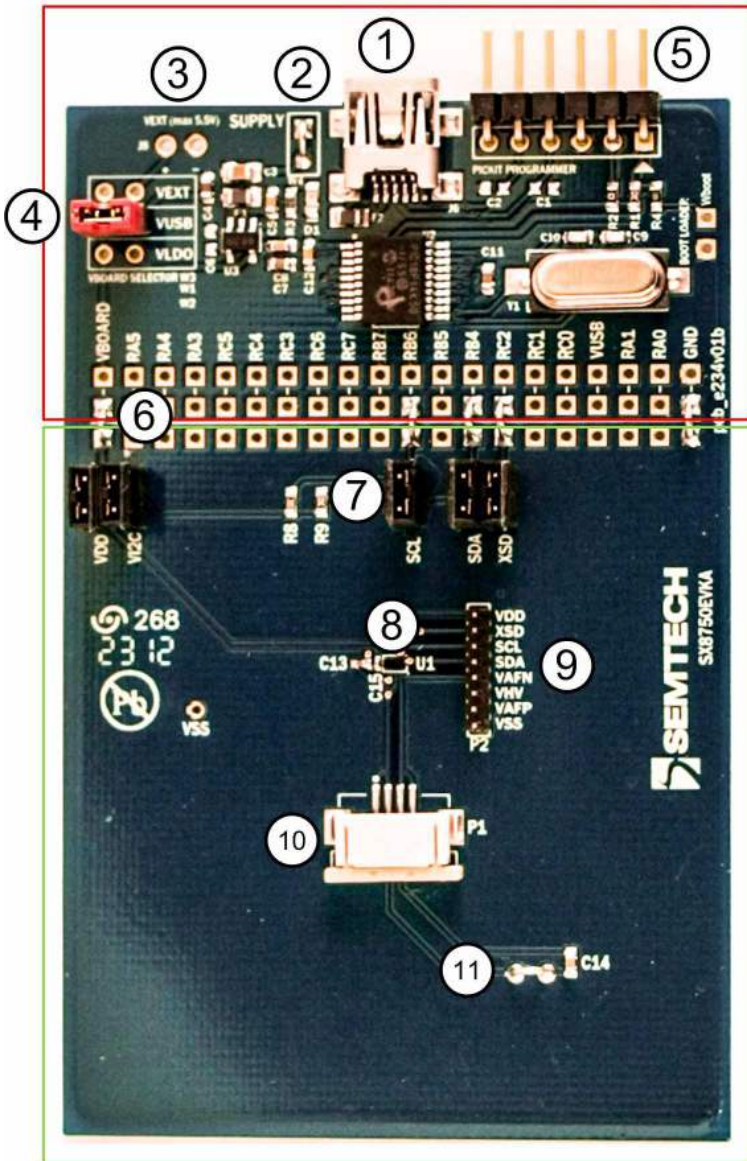
- ◆ SX8750 Datasheet

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1. Evaluation board overview

The evaluation board is shown on Figure 1.



The SX8750EVK is designed to evaluate the SX8750 behavior with the PoLight TLens or a 50nF capacitor load.

The board is made with two separate areas.

The Figure 1 shows the SX8750EVK top view. The separate areas are shown in the red and green squares.

The power and USB interface is located inside the red square.

The USB connector (1) connects the kit to the computer with the USB cable.

The wire (2) supplies the USB interface circuit.

A footprint for a connector (3) can be used to connect the board to an external power supply. The supply range is 2.4V-4.8V.

It is possible to power the board with three voltages. The external voltage (VEXT) coming from connector (3), the USB voltage (VUSB) or the 3.3V regulated voltage from the LDO (VLDO). The jumper (4) should be set to the desired location.

The wires on area (6) connect the USB interface to the main board shown in the green area.

The SX8750 device (8) is connected with its few externals.

By removing jumpers (7), it is possible to disconnect the SX8750 device to the supply, I2C communication and digital signals for direct control.

The DAC output and all the SX8750 pins are available on P2 connector (9).

The TLens can be connected on P1 connector (10). The default capacitor load wire connection (11) should be cut in that case.

Figure 1. SX8750EVK top view

2. Getting started

2.1. Software installation

Insert the CD into the CD-ROM drive of your computer. The installation should start automatically. If the installation does not start, launch the file "SX8750EvaluationKitSetup.exe" located at your CD ROM root directory.

If the Microsoft.NET Framework is not installed it will be installed automatically (An internet connection is required).

Choose the installation directory, when the installation is finished the GUI will launch.



Figure 2. GUI Installation

2.2. Running the GUI

Connect the board to your USB port and launch the GUI. The GUI can be launch from Windows "Start Menu>Programs>SX8750EVK>SX8750EVK".

The GUI automatically detects the board.

3. GUI overview

The Graphic User Interface (GUI) is divided in 4 sections:

1. The menu and tool bar
2. The SX8750 controls
3. The SX8750 registers access
4. The status bar

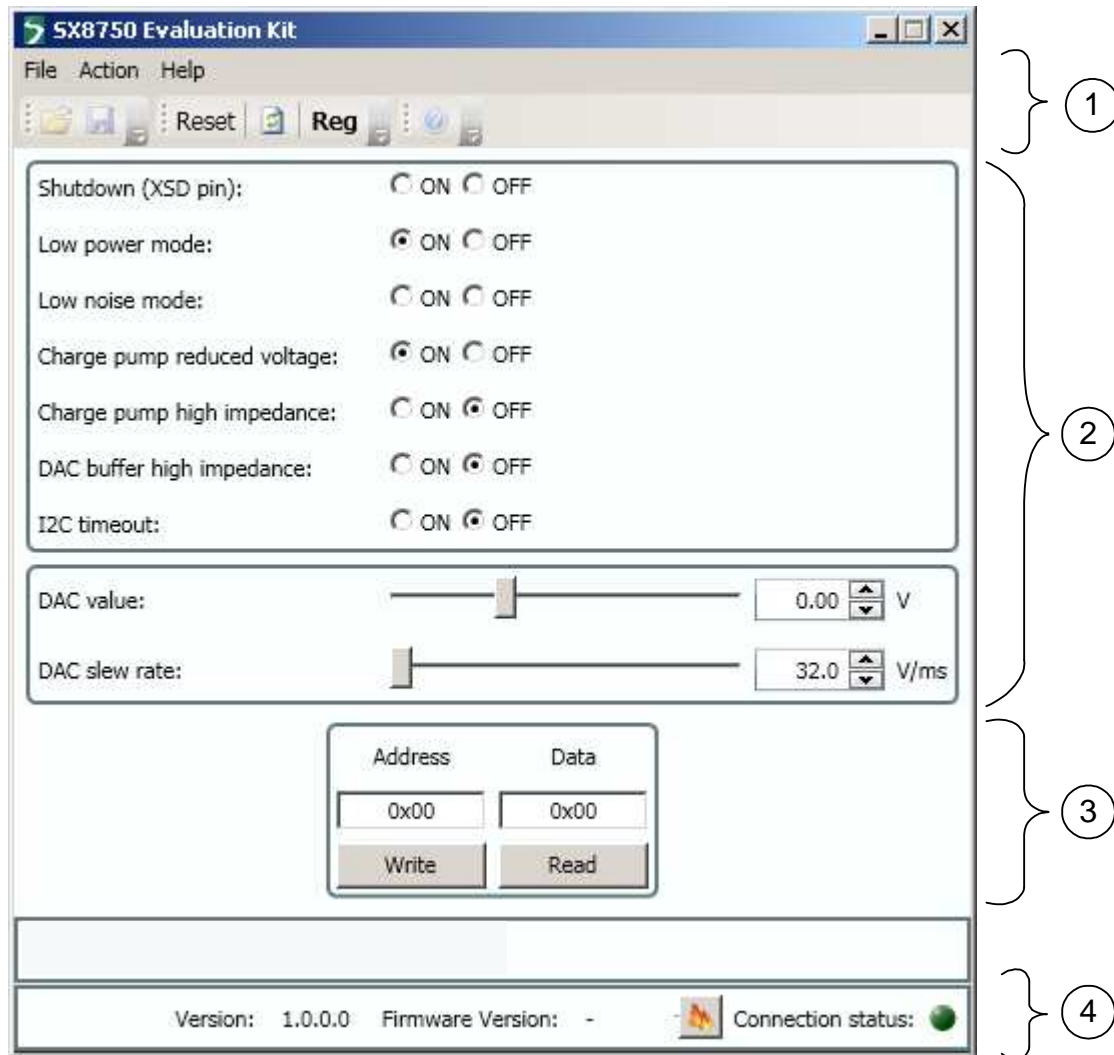


Figure 3. GUI overview

3.1. Menu and toolbar

The File menu gives the user the possibility to save or open a configuration.

The Action menu suggests a list of actions to the user.

- ◆ The Reset button performs a general call reset to reset the SX8750.
- ◆ The Refresh button actualizes the register view and control after a manual register write.

- ◆ The Show Registers button displays a window with the SX8750 registers. This register view allows registers writing. The Help menu is related to the user guide document. The toolbar allows a direct access to the action triggered in the menu.

3.2. SX8750 controls

The radio button and slider controls setup in an convenient way the SX8750 device via I2C writing to registers. The various controls are describes in Table 1.

Controls	Description
Shutdown	Controls the XSD pin to set the SX8750 in shutdown mode. In the shutdown mode the communication is disabled, the charge pump and the DACs are disabled. Low speed clock is disabled.
Low power mode	In low power mode, the SX8750 listens the I2C and performs no other action. This control should be set to OFF to check the DAC behavior.
Low noise mode	Enable / disable the low noise mode.
Charge pump reduced voltage	Limit VHV and the DAC maximum output voltage.
Charge pump high impedance	The charge pump controls the VHV pin. Setting to ON disable the charge pump during the low noise mode.
DAC buffer high impedance	Setting to ON disable the DAC during the low noise mode.
I2C time-out	In case the I2C communication is stuck, enabling the I2C time-out allows to reset the I2C interface.
DAC value	Slider to select the DAC output voltage Positive voltage is output on VAFP with VAFN =0V. Negative voltage is output on VAFN with VAFP=0V.
DAC slew rate	Limit the DAC slew rate. The 32.0V/ms setting does not limit the slew rate.

Table 1 Control descriptions

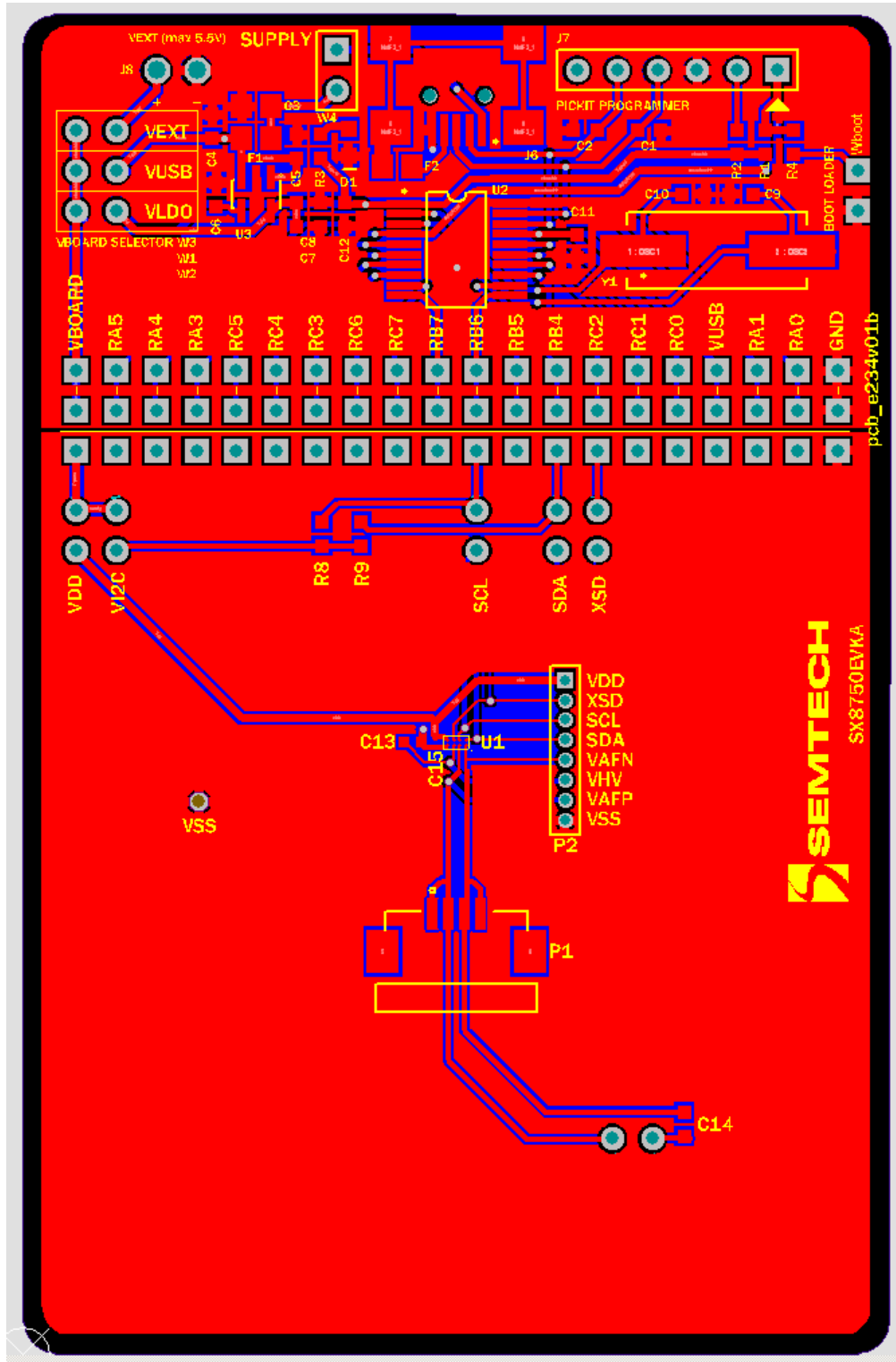
3.3. SX8750 register access

This control enables the write of 8 bits data in the selected register. The 8-bit address and data are in hexadecimal format, starting with the “0x” notation. To update the controls, a refresh should be done.

3.4. Status bar

The status bar displays the GUI version and the EVK firmware version. When the EVK is connected, the connection status led is green.

4. Board overview





SEMTECH

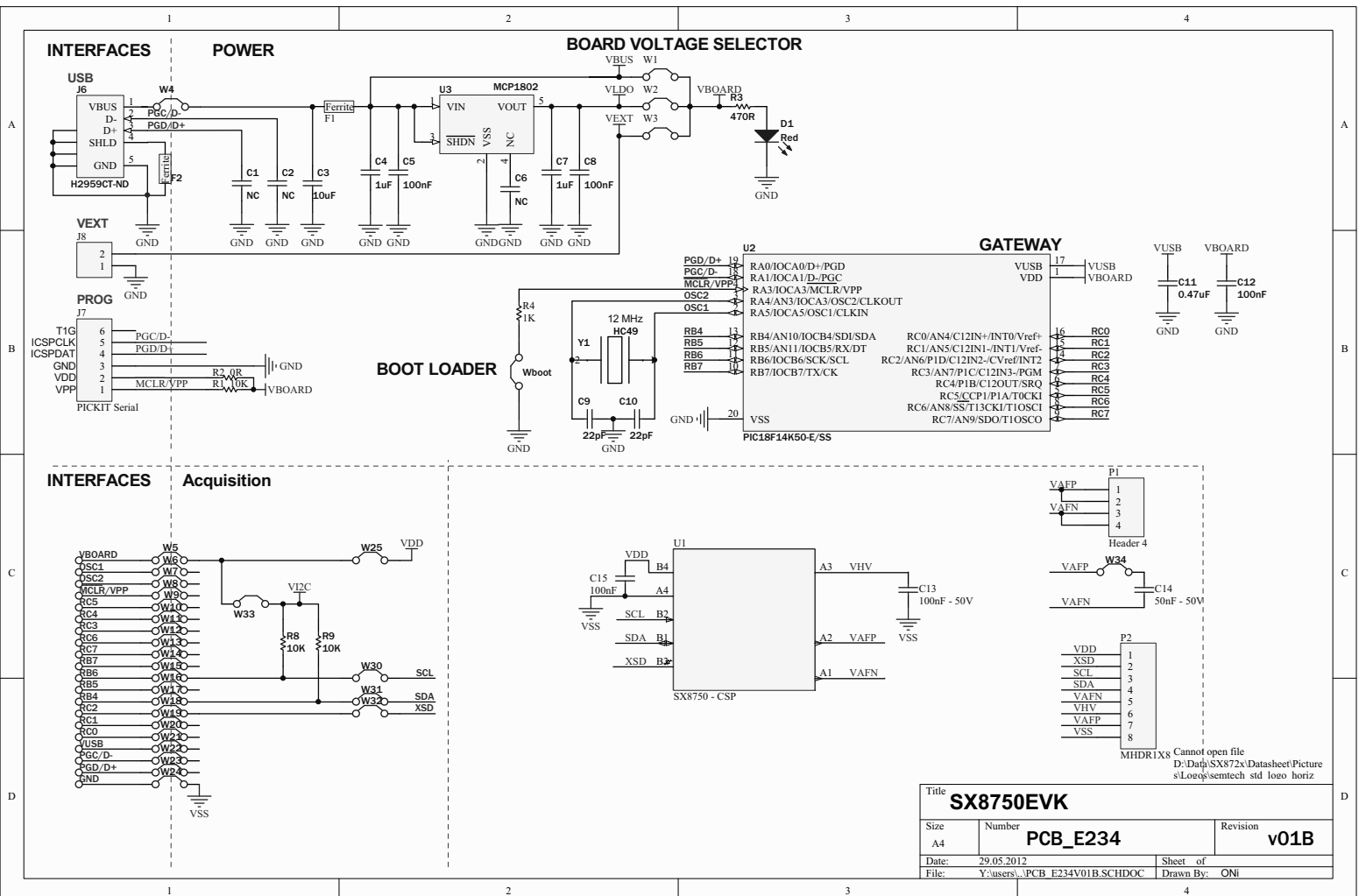
SX8750EVK

Evaluation Tool for SX8750

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USER GUIDE

5. Board schematics



Title SX8750EVK		
Size A4	Number PCB_E234	Revision v01B
Date: 29.05.2012	Sheet of	
File: Y:\users\...PCB_E234V01B.SCHDOC	Drawn By: ONI	

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