

Interfacing I²C EEPROM to PSoC[®] 3

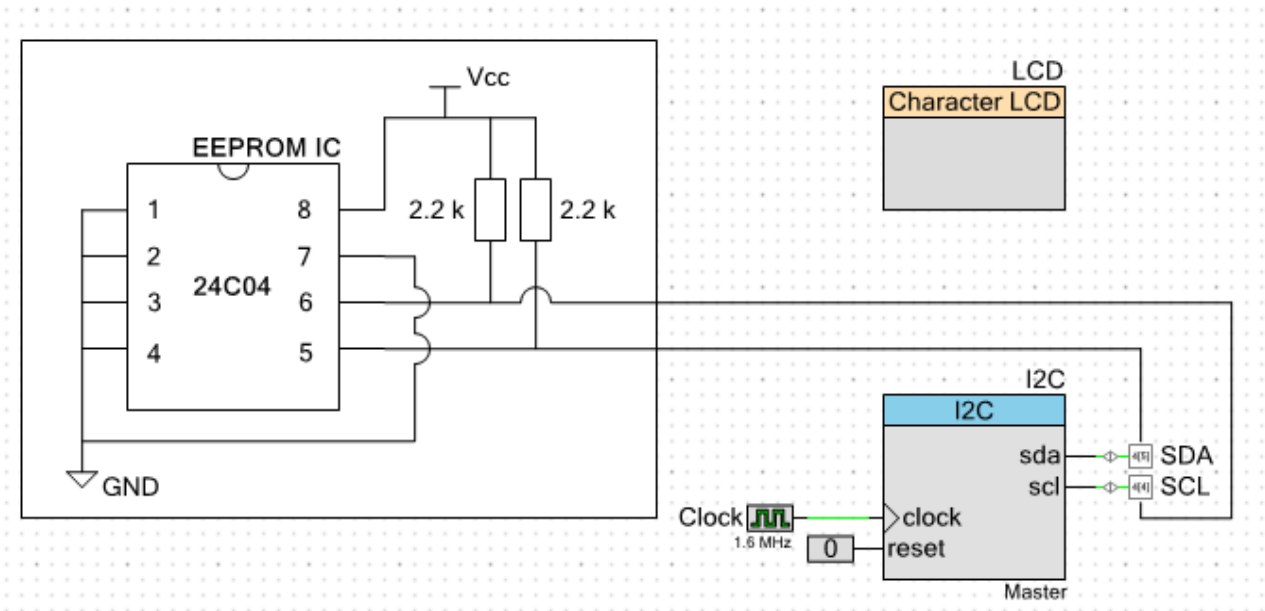
Project Objective

This project interfaces PSoC[®] 3 to a serial EEPROM (24C04) and reads/writes data from/to the EEPROM.

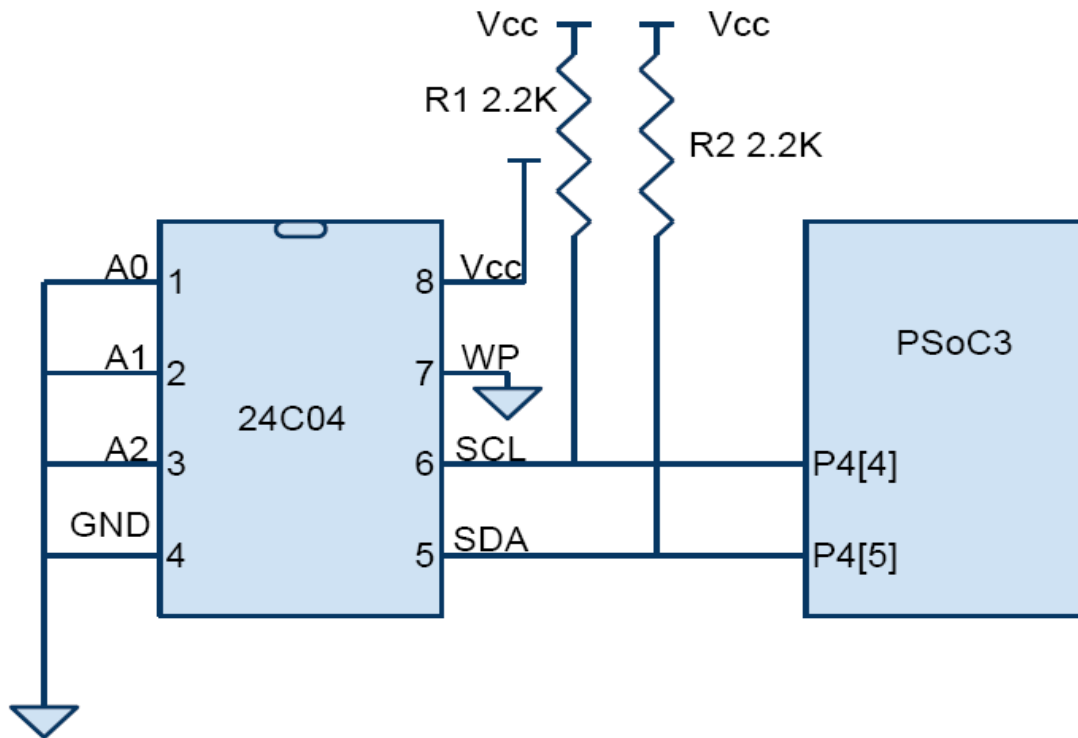
Overview

This project demonstrates how to interface a serial I²C EEPROM to PSoC 3 and how to read/write data to/from it using I²C Master.

Top Design



Hardware Connection on DVK



This device has 512 bytes of EEPROM with 16 byte page writes. Pins A0, A1, and A2 are used to connect multiple EEPROMS to a single I²C bus and to hardwire the three least significant bits (LSB) of the device address. In this example, these lines are tied to GND. The Write Protect (WP) pin is tied to GND so the EEPROM may be written. R1 and R2 are external pull-up resistors as the I²C bus operates in Open Drain mode. This schematic can be wired using the bread board area of the CY8CKIT-001 board.

Make the following connections on the CY8CKIT-001 board to test this project:

- Connect LCD on connector P18.
- Insert 24C04 on bread board.
- Connect pin numbers 1,2,3,4 and 7 of 24C04 to GND (GND is available on connector P14).
- Connect pin number 8 of 24C04 to 5V (5 V is available on connector P9).
- Connect a jumper between P4_4 of PSoC 3 (PORT A) and SCL line of 24C04.
- Connect a jumper between P4_5 (PORT A) of PSoC 3 and SDA line of 24C04.
- Connect 2.2 K Ω resistance between SCL line and Vcc.
- Connect 2.2 K Ω resistance between SDA line and Vcc.
- Enable the LCD power by placing the Jumper J12 to ON position
- Keep Vdd select switch in 5 V mode.
- Leave the remaining jumper settings on the DVK to their default state. For information on default jumper settings, refer to the “PSoC Development Kit Board Guide”.

Operation

On reset, all hardware settings from the device configuration are loaded into the device and *main.c* is executed.

The firmware performs the following operations:

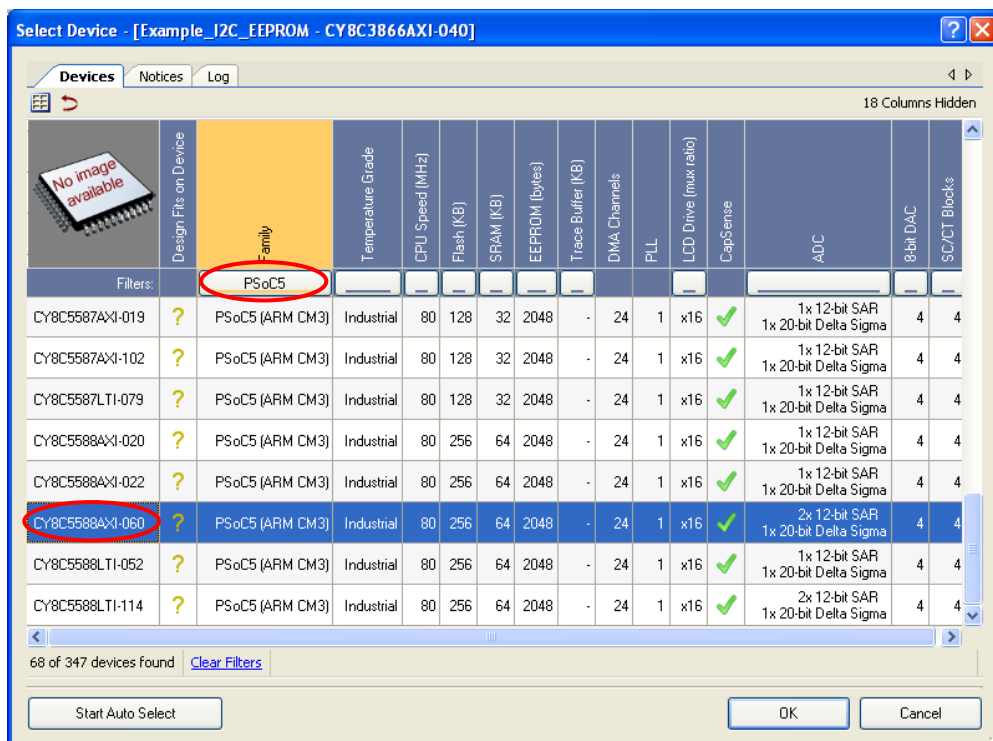
- The I2C module is configured as master and the interrupts are initialized.
- Data from the RAM buffer is written to the EEPROM using the `I2C_MasterWriteBuf` function.
- A while loop is used to check whether the data is transmitted completely.
- Then wait for 10 msec, which is the Write time (*twr*) of EEPROM.
- A single byte write is performed to write EEPROM address to the EEPROM.
- 16 bytes are read back from EEPROM and displayed on the LCD. The first eight bytes are displayed in row 0 and the remaining eight are displayed in row 1.

Output

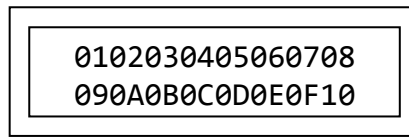
- Build the project and program the device
- Make the hardware connection as mentioned
- Press the **Reset** button
- Eight values from 0x01 to 0x08 are displayed in row 0 of LCD.
- The next eight values from 0x08 to 0x10 are displayed in row 1 of LCD.

Note The default device selection is PSoC 3 (CY8C3866AXI-040). To use this project with PSoC 5 family, do the following:

Go to **Project** → **Device Selector** and select **PSoC 5** device (CY8C5588AXI-060). Rebuild the project and program the PSoC 5 device with the rebuilt project. The device selector window is shown in the following figure.



The test procedure to be followed while checking this project on PSoC 5 is similar to that with PSoC 3.
A sample output LCD display is as follows.



0102030405060708
090A0B0C0D0E0F10