EE 308 Microcomputer Based System Design Assigned : 14/05/2021
Lab#5 Due : 28/05/2021 17:00

SPI Communications

The touchpad you have utilized on your PIC24FJ128GA204 board runs on a TTP229 capacitive detector IC. The communication protocol is unconventional: in the "16-keys active-low" setting, the normally-high SDO line is monetarily pulled low, and released back when a key input is detected. The actual key data is, then, retrieved by a synchronous protocol identical to SPI. The start-up codes for your board (both the assembly language and C versions) implemented the second part by bit banging.

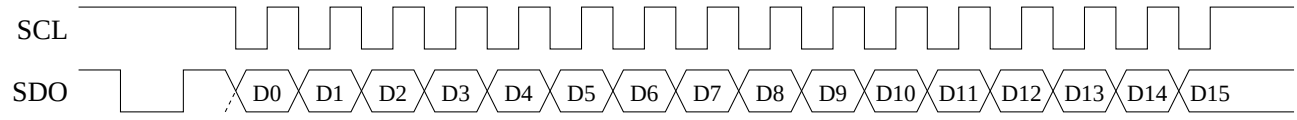

Figure 1: TTP229 16-keys active-low signaling convention (from product datasheet.)

In this assignment, you are asked to use the SPI interface for reading the keypad data. To do so, depending on your preference, you will either modify the relevant part of ee308new.s, or read_keypad() in keypad.c. When doing this,

- Appropriately set the SPI interface data input sample phase bit,
- Adjust the serial word length bits to 16-bit,
- Set clock frequency to match requirements of TTP229.

The code is expected to run by polling; SPI interrupts will not be activated. The data output of the SPI interface will not be used, so the output data has no significance. You may need to read section 16.0 of the PIC24FJ128GA204 datasheet.

Notes:

- You may work in groups of two.
- Upload your code before the deadline.
- The TTP229 datasheet is available in

  `http://acoustics.sabanciuniv.edu/ee308/doc/`

  with file name ttp229.pdf.

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