

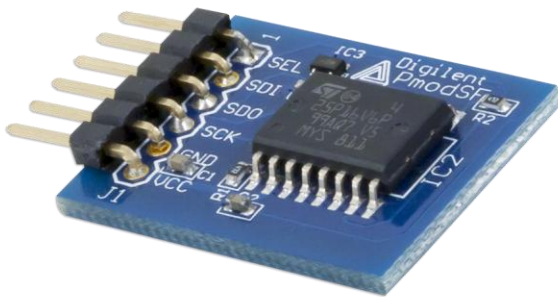
PmodSF™ Reference Manual

Revised April 16, 2015

This manual applies to the PmodSF rev. C

Overview

The Digilent PmodSF is a small serial flash module that helps demonstrate the uses of non-volatile memory.



The PmodSF.

Features include:

- ST Microelectronics M25P16 serial flash memory integrated circuit
- 16Mbit (2Mbyte) of flash memory
- More than 20 years of data retention

1 Functional Description

The PmodSF utilizes ST Microelectronics M25P16 which provides 16 Mbits of flash memory that can be accessed through the SPI protocol. Although this amount of memory is very small compared to modern flash drives, the PmodSF is a great way to get introduced to controlling non-volatile memory and can be easily incorporated into projects that need a way to store some information without using the USB interface.

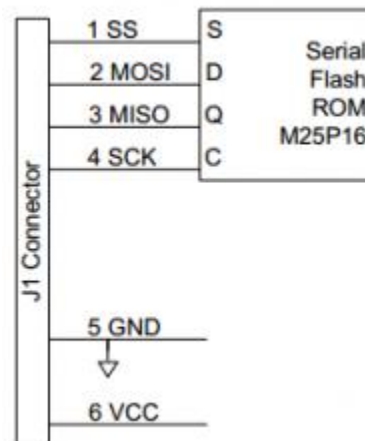
2 Interfacing with the Pmod

The PmodSF communicates with the host board via the SPI protocol. By bringing the Chip Select (CS) line low, users are able to issue a variety of read, write, and erase commands to the memory chip. A table of the available commands for the M25P16 from its respective datasheet is provided below:

| Instruction | Description | One-Byte Instruction Code | Number of Address Bytes | Number of Dummy Bytes | Number of Data Bytes |
|-------------|---|---------------------------|-------------------------|-----------------------|----------------------|
| WREN | Write Enable | 0x06 | 0 | 0 | 0 |
| WRDI | Write Disable | 0x04 | 0 | 0 | 0 |
| RDID | Read Identification | 0x9F | 0 | 0 | 1 to 3 |
| RDSR | Read Status Register | 0x05 | 0 | 0 | 1 to ∞ |
| WRSR | Write Status Register | 0x01 | 0 | 0 | 1 |
| READ | Read Data Bytes | 0x03 | 3 | 0 | 1 to ∞ |
| FAST_READ | Read Data Bytes at Higher Speed | 0x0B | 3 | 1 | 1 to ∞ |
| PP | Page Program | 0x02 | 3 | 0 | 1 to 256 |
| SE | Sector Erase | 0xD8 | 3 | 0 | 0 |
| BE | Bulk Erase | 0xC7 | 0 | 0 | 0 |
| DP | Deep Power-down | 0xB9 | 0 | 0 | 0 |
| RES | Release from DP and Read Electronic Signature | 0xAB | 0 | 3 | 1 to ∞ |
| | Release from DP | | 0 | 0 | 0 |

The address bits range from 0x000000 to 0x1FFFFFF, with the first two hexadecimal bits indicating which memory sector the data is located in. Thankfully, users do not have to explicitly worry about writing to and reading from the memory module, as there is a library that takes care of these commands for us.

| Pin | Signal | Description |
|-----|--------|------------------------------|
| 1 | ~CS | Chip Select |
| 2 | MOSI | Master-Out-Slave-In |
| 3 | MISO | Master-In-Slave-Out |
| 4 | SCK | Serial Clock |
| 5 | GND | Power Supply Ground |
| 6 | VCC | Positive Power Supply (3.3V) |



Any external power applied to the PmodSF must be within 2.7V and 3.6V; it is recommended that Pmod is operated at 3.3V.

2 Physical Dimensions

The pins on the pin header are spaced 100 mil apart. The PCB is 1 inch long on the sides parallel to the pins on the pin header and 0.8 inches long on the sides perpendicular to the pin header. .