**Motion Detection Block Prototype Datasheet**

**I Provide a level 1 block diagram, schematic diagram, flowchart, data flow diagram, and/or comprehensive function list of your block.**

* Make sure that ALL arrows on your block diagram are labeled with enough information that someone reviewing your block diagrams is able to measure the signals/data/power represented by each arrow.
* Label all test point positions.
* Make sure instruments do not obscure the schematic.
* Label all inputs and outputs on the schematic with names that are consistent with the tables below.
* If giving a function list, provide the names, descriptions, inputs, and return values of each function.

Power

3.3V/140µA

Test Point on

Power

Test Point on

Serial Clock

Test Point on

SDI Line

ADXL345

Accelerometer on Breakout

(with decoupling Caps)

y

Chip Select

SPI Serial Clock

SPI Serial Data Input

SPI Serial Data Output

Test Point on

SDO Line

x

z

Input from motion

in the x, y, and z axis

Figure 1: Level 1 Block Diagram Motion Detection

**II List all software and hardware inputs to your block.**

* State the types of signals and the expected ranges of signals entering your block.
* If you are doing code development provide test inputs used to verify functionality. Provide all function names, a description of each function, input parameters, and each function’s return value.
* You may add more lines to these tables as needed. Please expand message boxes as required for detail.

|  |  |  |
| --- | --- | --- |
| Input Name | Description of Signal | Expected Range |
| SCLK | A serial clock that regulates the flow of data | Serial |
| CS | A bit that controls when the data starts and stops Tx/Rx | 0-5V |
| SPI In | A serial signal that addresses the PIC to request specific data and set registers | Serial |
| Power | Supplies power to the device | 3.3 V |

**Provide graphs of time dependent signals at each input in the space below. Make sure the graph is formatted professionally and readable. If your project is code then provide a table of example input values with explanations and recorded test output.**

**III List the outputs to your block.**

* State the types of signals and the expected ranges of signals leaving your block.
* If you are doing code development please use dummy functions as test outputs. Provide all function names, a description of each function, input parameters, and each function’s return value.
* You may add more lines to these tables as needed. Please expand message boxes as required for detail.

|  |  |  |
| --- | --- | --- |
| Output  Name | Description of Signal | Expected Range |
| SPI Output | A serial digital signal that has been requested by the PIC that will give us values of the acceleration as the device is moved | Serial |
|  |  |  |
|  |  |  |
|  |  |  |

**Provide graphs of time dependent signals at each output in the space below. Make sure the graph is formatted professionally and readable. If your project is code then provide a table of example output values with explanations and recorded test output.**

**IV Signals at test points.**

* State the types of signals at each of the test points of your block. Provide a minimum and maximum range for these signals.
* If you are doing code development please use debug statements to test values. Provide locations and the expected values for each of these statements.
* You may add more lines to these tables as needed. Please expand message boxes as required for detail.

|  |  |  |
| --- | --- | --- |
| T.P.  Name | Description of Signal and measurement conditions | Range of  Values |
| SCLK | We can test the accuracy of the clock being applied | 0-5V |
| SPI In | We will be able to see if the PIC is sending data | 0-5V |
| SPI Output | We can see if the accelerometer is sending data to the PIC |  |
|  |  |  |

**Provide graphs of time dependent signals at each test point in the space below. Make sure the graph is formatted professionally and readable. If your project is code then provide a table of example internal/test values with explanations and recorded test output.**

**TA Scoring Sheet**

Student Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

TA Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Due Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Date Demonstrated: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

|  |  |  |
| --- | --- | --- |
| **Points Awarded** | **What Evaluator is Looking For** | **Possible Points** |
| ######## | **I Diagrams, flowchart, and/or pseudocode** | **15** |
|  | * Level 1 Block diagram | 5 |
|  | * Inputs and outputs and testpoints clearly labeled? | 5 |
|  | * Is diagram sufficiently detailed and correct? | 5 |
| ######## | **II Inputs** | **15** |
|  | * Are all inputs from block diagram and schematic listed and are values backed up by measured data? | 10 |
|  | * Are inputs measured and graphed/tabulated? | 5 |
| ######## | **III Outputs** | **15** |
|  | * Are outputs from block diagram and schematic listed and are values backed up by measured data? | 10 |
|  | * Are outputs measured and graphed/tabulated? | 5 |
| ######## | **IV Test points** | **15** |
|  | * Are test points from block diagram and schematic listed and are values backed up by measured data? | 10 |
|  | * Are “test points” / “dummy function” graphs/ values given in a manner they can be used for system debugging? Software execution times listed? | 5 |
| ######## | **Overall: System Works** | **40** |
|  | Does the system function as it is supposed to? | 20 |
|  | Does the student have a clear path to correct/improve this block? | 10 |
|  | Is the student knowledgeable about their project? | 10 |
| **\_\_\_\_\_/100** | **Overall Evaluation** | **100** |

Comments: