

Subsystem Design

5V Interface

Description

This example demonstrates how to interface with signals up to 5V using open-drain IOs (ODIOs) on an MSPM0 device. With the use of external pullup resistors, the open-drain IOs allow for communication across multiple voltage domains at voltage levels higher than the MSPM0 V_{DD} supply voltage.

Figure 1-1 displays a functional block diagram of the peripherals used in this example.

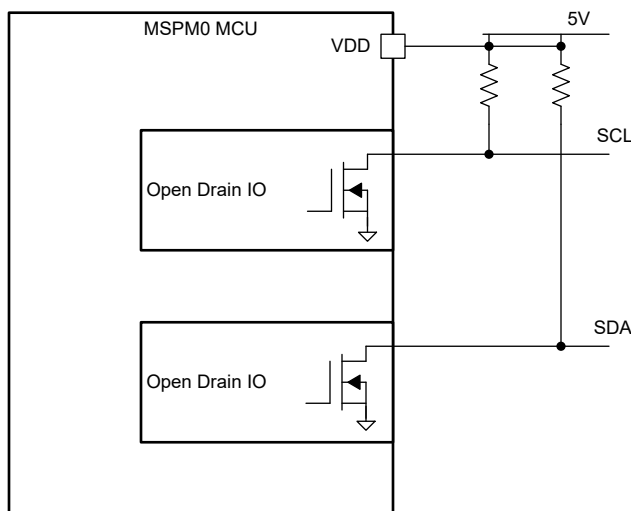


Figure 1-1. Subsystem Functional Block Diagram

Required Peripherals

This application can use up to two open-drain IOs.

Sub-block Functionality	Peripheral Use	Notes
IO	2 GPIO pins	PA0 and PA1, can only use 5V tolerant open-drain IOs

Design steps

1. Connect appropriate jumpers.
2. Determine the pullup resistance needed for your application.
 - a. The required pullup strength depends on the timing requirements of your application and the capacitance of your connections. For greater capacitance, you need to have a stronger (that is, low resistance) pullup. A discussion on determining the exact resistance of a pullup is beyond the scope of this document but can be found in the [I2C Bus Pullup Resistor Calculation application note](#).
3. Configure peripherals that are used on these pins in software (for example, UART, I2C, or Timer) in [SysConfig](#).
4. Write application code, dependent on peripherals used.

Design considerations

1. Pullup resistor: A pullup resistor is required to output high for I2C and UART functions on ODIOs.
2. Drive strength control: This is not available for ODIO types.

Additional Resources

- [Download the MSPM0 SDK](#)
- [Learn more about SysConfig](#)
- [MSPM0L LaunchPad](#)
- [MSPM0G LaunchPad](#)

Revision History

Changes from Revision * (March 2023) to Revision A (August 2025)	Page
• Removed Compatible Devices section.....	1

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