

PSU01A1 Specification

**GOS2022**

PSU01A1 Specification

**Power Switch Unit Version 01, Revision A1**

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| --- | --- | --- | --- | --- |
| Version history | | | | |
| Version | Date | Author | Change | Released |
| 1.0 | 2024-12-03 | Ahmed Gazar | Initial version of document. |  |
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# **Chapter 1** Introduction

## Purpose

The purpose of this document is to give a full description of the Power Switch Unit board.

## System Context

PSU01A1 is designed to be part of the modular main board development (MB02XX). This unit is responsible for providing an interface between the CPU board and the peripheries allowing the base software to individually switch on/off power supplies of each peripheral. The circuit is based on the MCP23017 I/O extender chip that is available via I2C interface. The board address is the same as the address of the extender chip. This address is configurable via the address I/Os.

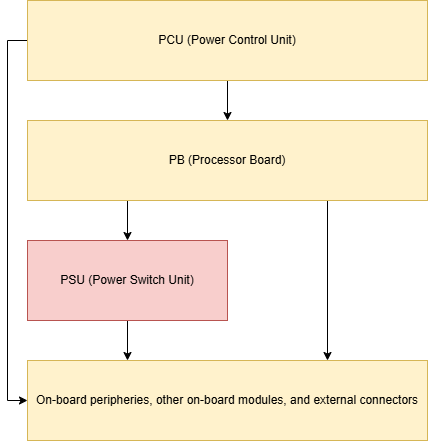


Figure : System Context

## Board Interface

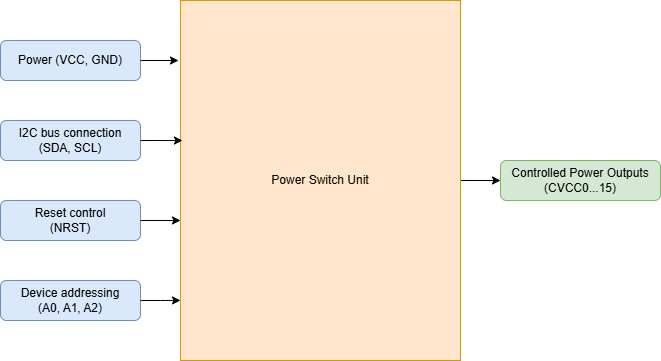


Figure : Board Interface

The board serves as a power interface between the CPU board and the peripheries.

The board has the following inputs:

* VCC and GND – these supply the extender chip as well as outputs
* SDA, SCL – I2C signals for communication with the extender chip
* NRST – reset control signal
* A0, A1, A2 – addressing input for I2C device address

The board provides the following outputs:

* CVCC0…15 – 16 individually controlled power outputs

# **Chapter 2** Design Description

## MCP23017 I/O Extender

|  |  |
| --- | --- |
| ID.0001 | Extender as I2C interface for switching power outputs |
| TODO | |

## Power Switch Circuit

|  |  |
| --- | --- |
| ID.0002 | Power switch circuit |
| TODO | |

## On-board Connectors

|  |  |
| --- | --- |
| ID.0003 | Connectors |
| TODO | |

## PCB design

|  |  |
| --- | --- |
| ID.0004 | Full PCB layout |
| TODO | |

|  |  |
| --- | --- |
| ID.0005 | Copper top layer |
| TODO | |

|  |  |
| --- | --- |
| ID.0006 | 2D PCB preview with standard color |
| TODO | |

## Parts list

|  |  |
| --- | --- |
| ID.0007 | Parts list |
| |  |  | | --- | --- | | **Part name** | **Description** | | IC1 | MCP23017 (SOIC28) | | J1, J2 | 1x4 pin header | | J3 | 1x16 pin header | | PWR\_LED | 1206 SMD LED | | Q1, Q3, Q5, Q7, Q9, Q10, Q11, Q12, Q17, Q18, Q19, Q20, Q21, Q22, Q23, Q24 | 2N3904 (TO92) | | Q2, Q4, Q6, Q8, Q13, Q14, Q15, Q16, Q25, Q26, Q27, Q28, Q29, Q30, Q31, Q32 | 2N3906 (TO92) | | R1, R3, R4, R6, R7, R9, R10, R12, R13, R14, R15, R16, R21, R22, R23, R24, R25, R26, R27, R28, R29, R30, R31, R32, R41, R42, R43, R44, R45, R46, R47, R48 | 10 kOhm (1206) | | R2, R5, R8, R11, R17, R18, R19, R20, R33, R34, R35, R36, R37, R38, R39, R40 | 100 kOhm (1206) | | R49 | 1 kOhm (1206) |   TODO | |

# **Chapter 3** Testing

# **Chapter 4** Software Interface

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