Isolated digital inputs

v1.0.0

Monday, 05 September 2016

# Revision history

|  |  |  |  |
| --- | --- | --- | --- |
| Date | Version | Description | Author |
| 2016-09-03 | 1.0 | Initial specification | Dominik Guz |
|  |  |  |  |

Table of contents

[Revision history 2](#_Toc460667287)

[Architectural Representation 4](#_Toc460667288)

[purpose 4](#_Toc460667289)

[scope 4](#_Toc460667290)

[references 4](#_Toc460667291)

[definitions 4](#_Toc460667292)

[Architectural Goals and Constraints 5](#_Toc460667293)

[Non-functional requirements 5](#_Toc460667294)

[functional requirements 5](#_Toc460667295)

[environmental requirements 5](#_Toc460667296)

[Dependency requirements 5](#_Toc460667297)

[Use-Case View 6](#_Toc460667298)

[Logical view 7](#_Toc460667299)

[Process view 8](#_Toc460667300)

[Module decomposition view 9](#_Toc460667301)

[Deployment view 10](#_Toc460667302)

[Size and performance 11](#_Toc460667303)

[Issues and concerns 12](#_Toc460667304)

# Architectural Representation

## purpose

Circuit specification for digital inputs with optical isolation.

## scope

Specification of circuit parameters along with list of used components.

Proposed circuit model and drawing of specified circuit.

## references

## definitions

# Architectural Goals and Constraints

## Non-functional requirements

## functional requirements

1. Minimum 1kV isolation
2. Internal side 3.3V logic compatible
3. External side overcurrent protected
4. Noise decoupling over 10khz
5. Minimum 1Khz upper frequency

## environmental requirements

## Dependency requirements

## Operating conditions

# Requirements analysis

## Circuit parameters

### Operating condtions

### Voltage ranges

1. Input range 2-24V
2. Output 3.3V compatible

### Power consumption

1. <5mA ON current

### Frequency ranges

1. >1Khz operating frequency

### Dimensions

## Components comparision

### Manufacturers list

1. Vishay
2. Fairchild
3. Toshiba
4. Lite-On

### Comparison table

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Part Code | Manufacturer | Available | Price/1unit($) | Meets Non-Func Req | Publication Date | Extras |
| H11L1SR2M | Fairchild | Y | 1.11 | Y | 2014 | 1Mhz freq |
| 6N137 | Lite-On | Y | 0.94 | Y | 2014 | low power |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |

## Component selection

### Matching components list

### Optimization goals

## Component specification

# Circuit model

## Block diagram

# Circuit drawing

# Circuit simulation results

# Implementation notes

# Issues and concerns