

PI5USB1468 / PI5USB1468A PI5USB1468/PI5USB1468A EVB Rev.A User Manual by Noyes Mok

Introduction

Pericom's PI5USB1468 and PI5USB1468A are the USB sleep & charge switch with Vbus switch control function which provides multimode supports auto-detection and auto-switching between modes by detecting correctly plugged in device.

The PI5USB1468 series evaluation board (EVB) is designed to demonstrate the benefits, performance and key features of PI5USB1468 and PI5USB1468A. This user manual describes the usage of this EVB and it will be divided into following sections:

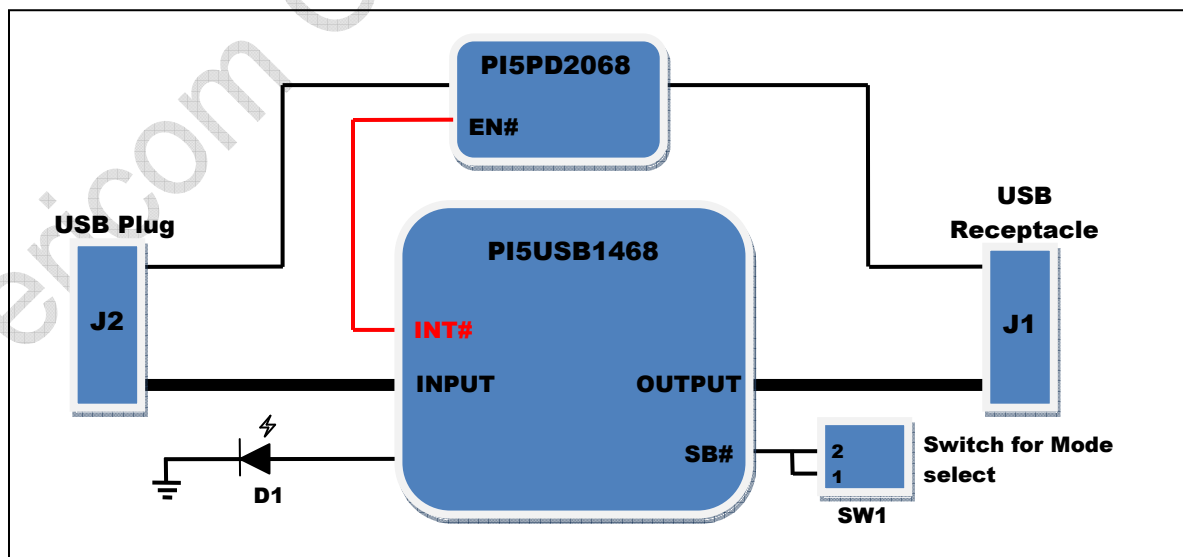
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 - PI5USB1468/PI5USB1468A EVB Schematic
 - PCB Layout
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Overview

Figure 1(a) & 1(b) are the block diagrams of Pericom PI5USB1468/PI5USB1468A Evaluation board (EVB) and Figures 2(a) & (b) are the top and bottom view of EVB board. There is an USB plug connectors (J2) which is used to connect PC's USB port and the USB receptacle connector (J1) is used to connect mobile devices.

An external Vbus switch PI5PD2068/PI5PD2069 is assembled on EVB which is controlled by the INT# / INT pin of PI5USB1468/PI5USB1468A.

The MODE setting in SW1 is used to select the normal USB operation and simulate the Standby or Sleep mode (S3/ S4) of the PC. The LED D1 is used to show whether the circuit is over-current or over-temperature. PI5USB1468/PI5USB1468A operation required +5V which was supplied by the PC through the USB connector (J2) or external power supply +5V through JP2 & JP3.



The schematic diagram illustrates the internal circuitry of a USB Type-C to USB-A adapter. Key components and their connections are as follows:

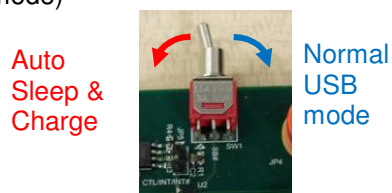
- PI5PD2069 (PD Controller):** Its **EN** (Enable) pin is connected to the **VBUS** line of the **USB Plug (J2)**.
- PI5USB1468A (USB Controller):**
 - INT** (Interrupt) pin: Connected to the **EN** pin of the PI5PD2069.
 - INPUT** pins: Connected to the **D+** and **D-** data lines of the **USB Plug (J2)**.
 - OUTPUT** pins: Connected to the **D+** and **D-** data lines of the **USB Receptacle (J1)**.
 - SB#** (Sleep/Bist) pin: Connected to a **Switch for Mode select (SW1)**, which has terminals 1 and 2, and is also connected to ground.
- Diode D1:** A protection diode connected between the **VBUS** line of the USB Plug (J2) and ground.

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Quick Start

To start-up the PI5USB1468/ PI5USB1468A EVB, complete the following steps:

1. Check the head pin status and SW1 setting follow Table 1
2. EVB USB connector J2 plugged into PC's USB connector.
3. For Normal USB operation, SW1 switch to RIGHT side (SB# = 1 - Normal USB mode)
For Auto sleep and charge mode on mobile device charging, SW1 switch to LEFT side (SB# = 0 - Auto sleep and charge mode)



4. Power up the PC
5. Plug the mobile device into EVB USB connector J1

Header pin is set as defaulted on EVB.

Header pin #	Pin name for PI5USB1468	Pin name for PI5USB1468A	Switch status	Remark
JP1	VBUS_OUT	VBUS_OUT	Short	
JP4	VDD	VDD	Short	EVB power up by the PC
JP5	SEL	SEL	Short	SEL = H
SW1	Configure mode	Configure mode	LEFT → SB#=0 (Auto sleep and charge) RIGHT → SB#=1 (Normal USB mode)	

- Auto sleep and charge mode was set as default on EVB

Table 1, Header pin settings for EVB (header pins location refers to Figure 4)

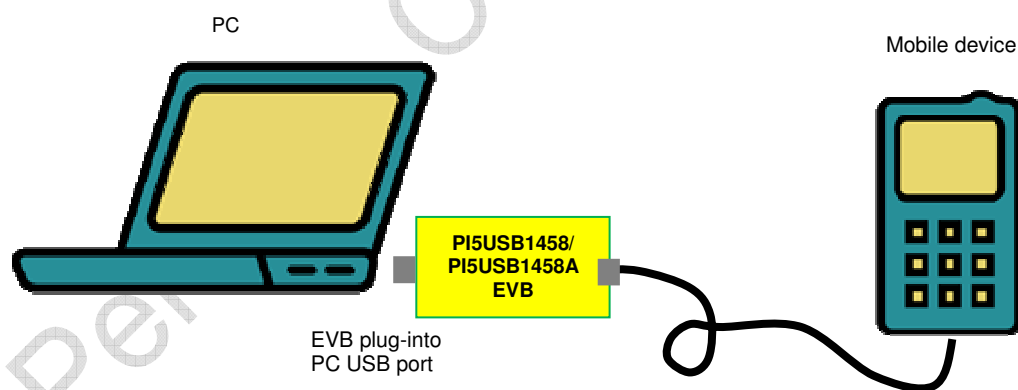


Figure 3, Connection of PI5USB1468 / PI5USB1468A EVB

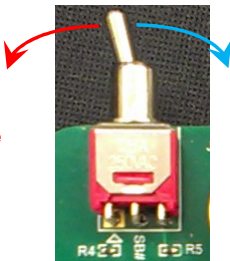
Detail Description

The functionality of header pins, switch are detail described in this section.

Functionality of Header Pins & Banana Jack

Header Pin	Description		Remark
	PI5USB1468	PI5USB1468A	
JP1	Pin 1 = PI5PD2068 output Pin 2 = Vbus pin of USB receptacle connector	Pin 1 = PI5PD2069 output Pin 2 = Vbus pin of USB receptacle connector	Short = connect the +5V output to USB receptacle connector
JP4	Pin 1 = Vbus from USB plug Pin 2 = VDD of PI5USB1468	Pin 1 = Vbus from USB plug Pin 2 = VDD of PI5USB1468A	Short = EVB power up by Vbus of USB plug Open = EVB need to power up by external power supply
JP5	Pin 1 = 10kohm to +5V Pin 2 = SEL of PI5USB1468	Pin 1 = 10kohm to +5V Pin 2 = SEL of PI5USB1468A	Short → SEL = high Open → SEL = Low
Banana Jack	Description		Remark
	PI5USB1468	PI5USB1468A	
JP2	GND	GND	If use external power support, JP4 must be Open
JP3	+5V from external power support	+5V from external power support	

Functionality of Switches

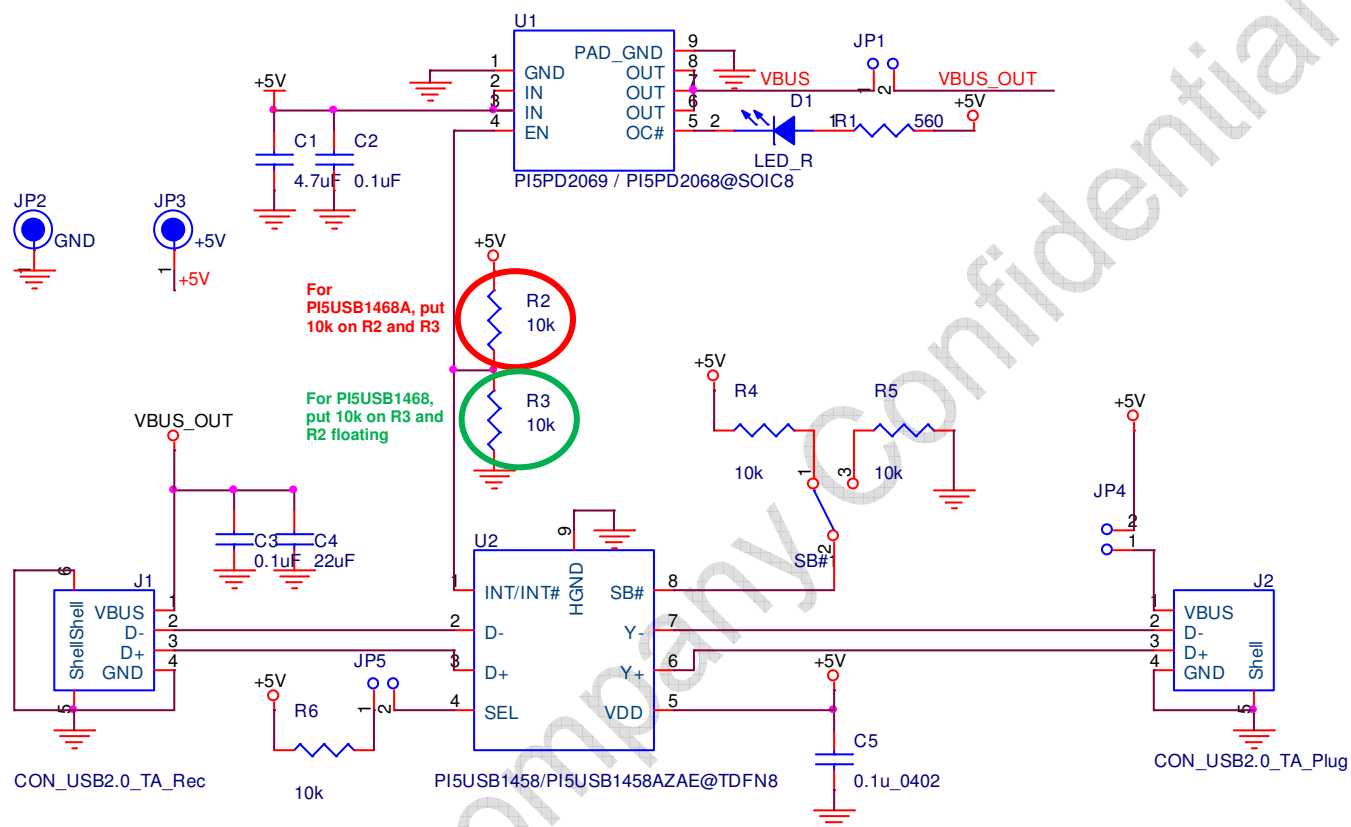
Switch	Pin on PI5USB1468/ PI5USB1468A	Description
SW1	SB#	<p>Configure Mode, 0 (LEFT side) = Sleep and charge mode, 1 (RIGHT side) = Normal USB mode</p> 

Switches and header pin Setting

SB#	SEL	Feature
SW1	JP5	
0	0	Auto Sleep & Charge - with keyboard/mouse pass through
	1	
1	0	S0 charging with SDP only
	1	S0 charging with CDP / SDP (depends on external device)

Board Design Information:

➤ PI5USB1468/PI5USB1468A EVB Schematic



Remark: The EVB layout for PI5USB1458, PI5USB1458A, PI5USB1468 and PI5USB1468A are the same.

➤ PCB Layout

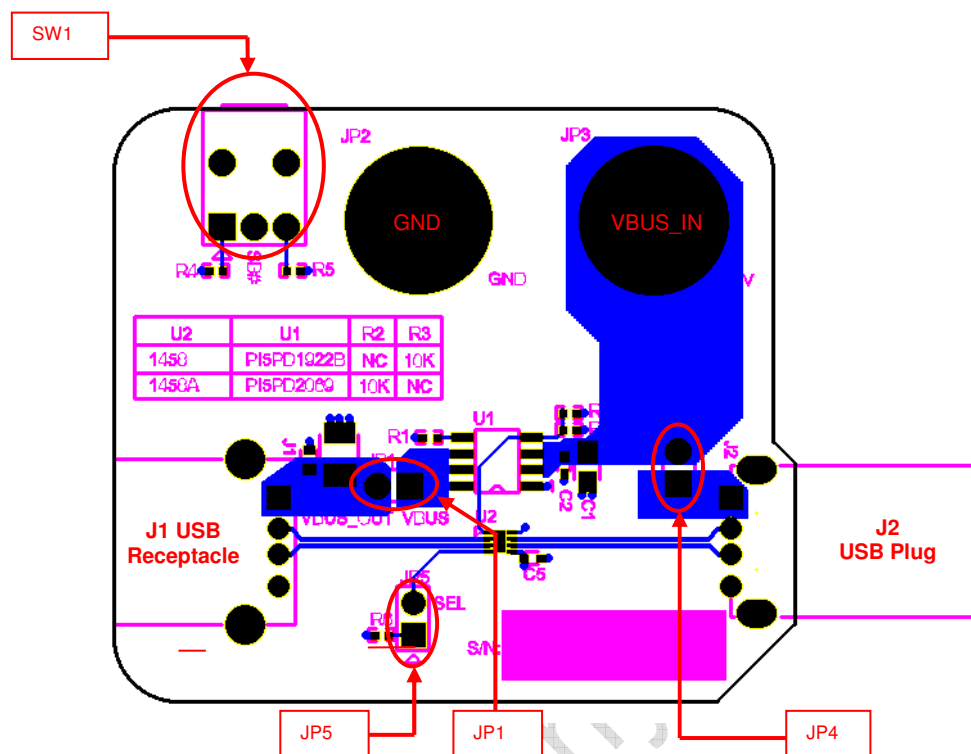


Figure 4, Top view of PI5USB1468/PI5USB1468A EVB Layout

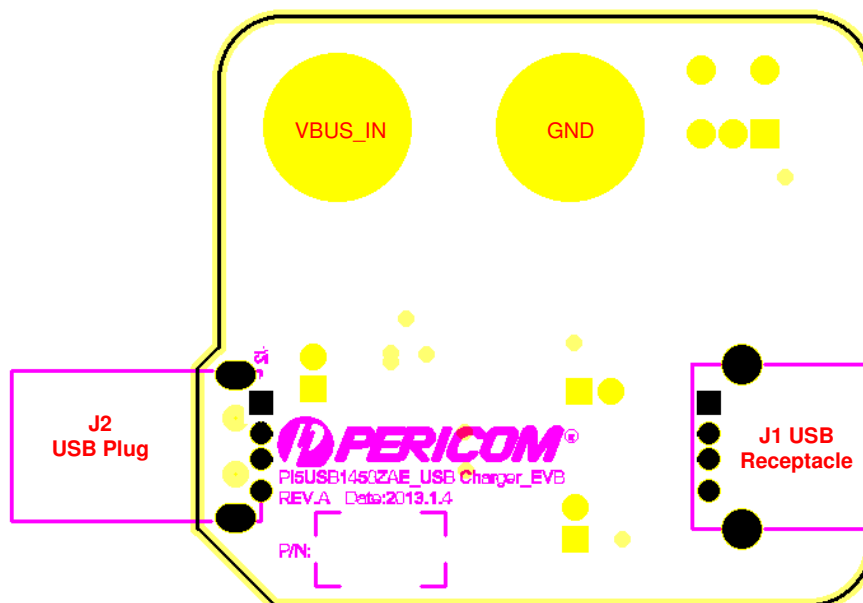


Figure 5, Bottom view of PI5USB1468/PI5USB1468A EVB Layout

➤ PCB Layout Requirements

a. Stack Up:

Layer #	Plane	Material Type	Thickness (mil)
	Solder Mask		0.4
Layer 1	Signal		1.2
	Prepreg	FR4 1080 FR4 2216	7.3
Layer 2	GND		1.2
	Core		44
Layer 3	Power		1.2
	Prepreg	FR4 2216 FR4 1080	7.3
Layer 4	Signal		1.2
	Solder Mask		0.4

b. Isolation Spacing = 30 mil

c. Width & Spacing (W/S) of 90Ω Differential Trace = 11 / 10 / 11 mil

➤ BOM List

Item	Quantity	Reference	Description
1	1	C1	4.7uF Capacitor
2	3	C2, C3, C5	0.1uF Capacitor
3	1	C4	22uF Capacitor
4	1	D1	Red LED
5	3	JP1, JP4, JP5	2X1 Header Pin
6	2	JP2, JP3	Banana Jack
7	1	J1	USB 2.0 Receptacle connector
8	1	J2	USB 2.0 Plug connector
9	1	R1	560Ω Resistor
10	6	R2, R3, R4, R5, R6, R14	10kΩ Resistor
11	1	SW1	SPDT switch
12	1	U1	PI5PD2068 / PI5PD2069
13	1	U2	PI5USB1468 / PI5USB1468A