

Red Pitaya d.o.o.  
Velika pot 22  
5250 Solkan  
Slovenia

[www.redpitaya.com](http://www.redpitaya.com)

***Electrical schematics for:***

***product: STEMlab\_125-14***

***version: V1.1***

***variant: STEMlab 125-14***

***release date: 13. 9. 2021***



Copyright 2014, Red Pitaya d.o.o. All Rights Reserved.

By exception, this version of document may be freely reproduced, distributed, republished, displayed, posted, transmitted or copied in any form or by any means, as is without modifications in its contents, without the prior written permission of Red Pitaya d.o.o.

Red Pitaya and the Red Pitaya logo are registered trademarks of Red Pitaya d.o.o. All trademarks and trade names are the properties of their respective owners and Red Pitaya d.o.o. disclaims any proprietary interest or right in trademarks, service marks and trade names other than its own.

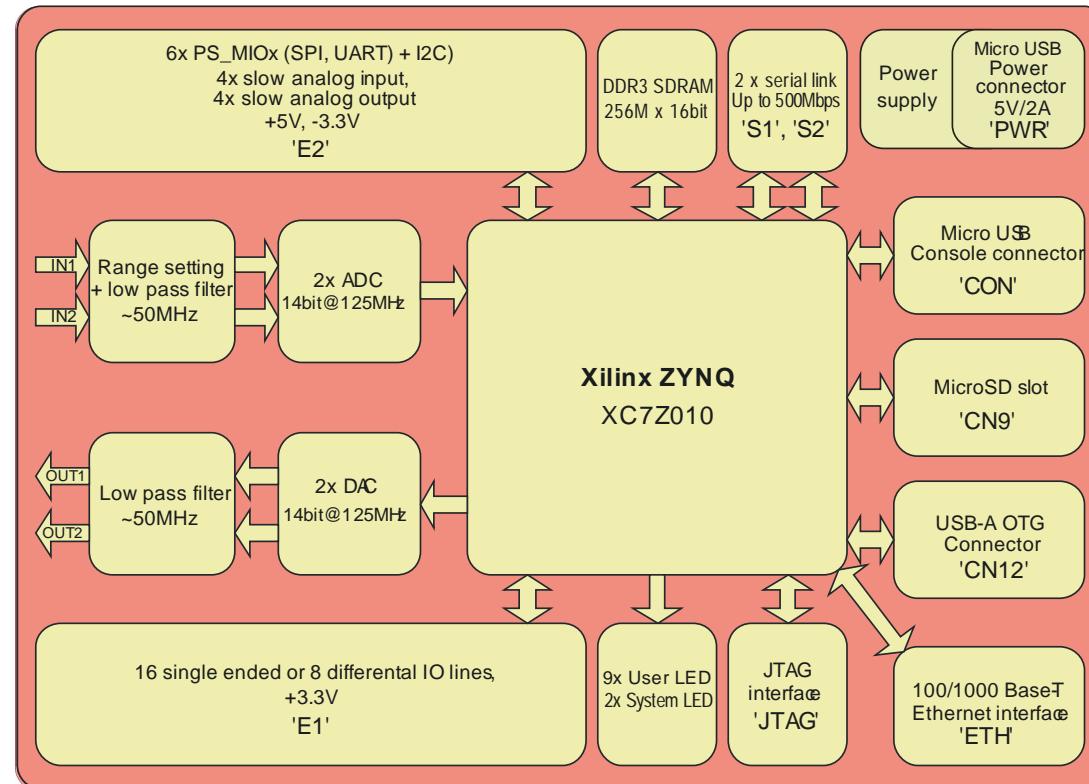
Red Pitaya is not responsible for typographical or other errors or omissions or for direct, indirect, incidental or consequential damages related to this material or resulting from its use.

Red Pitaya makes no warranty or representation respecting this material, which is provided on an "AS IS" basis.

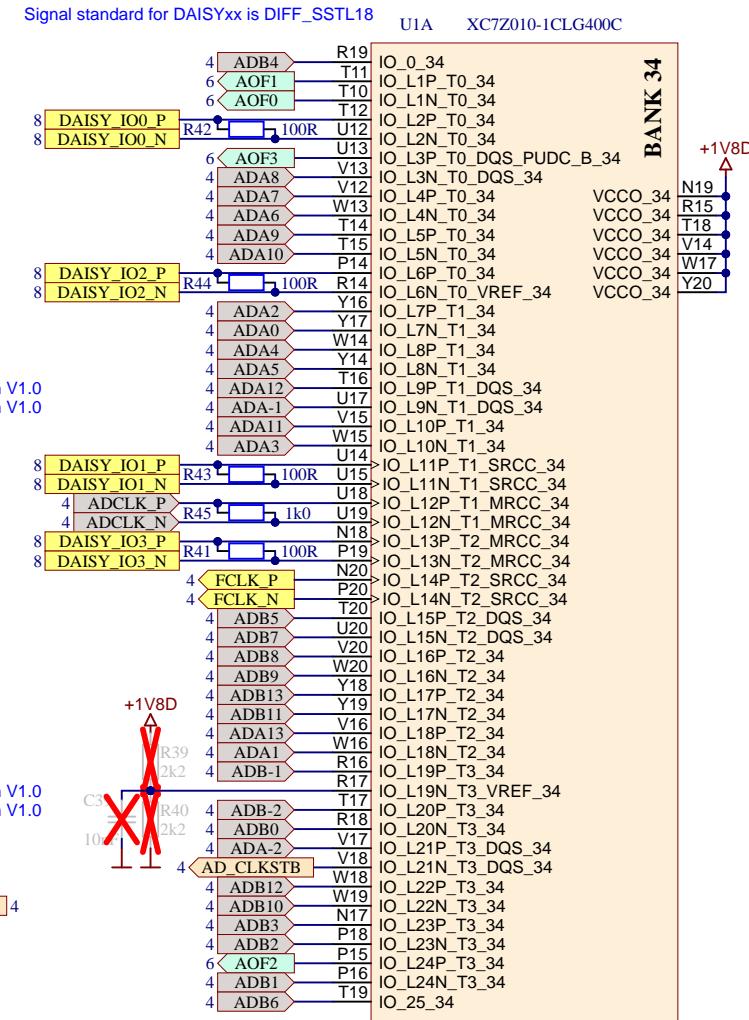
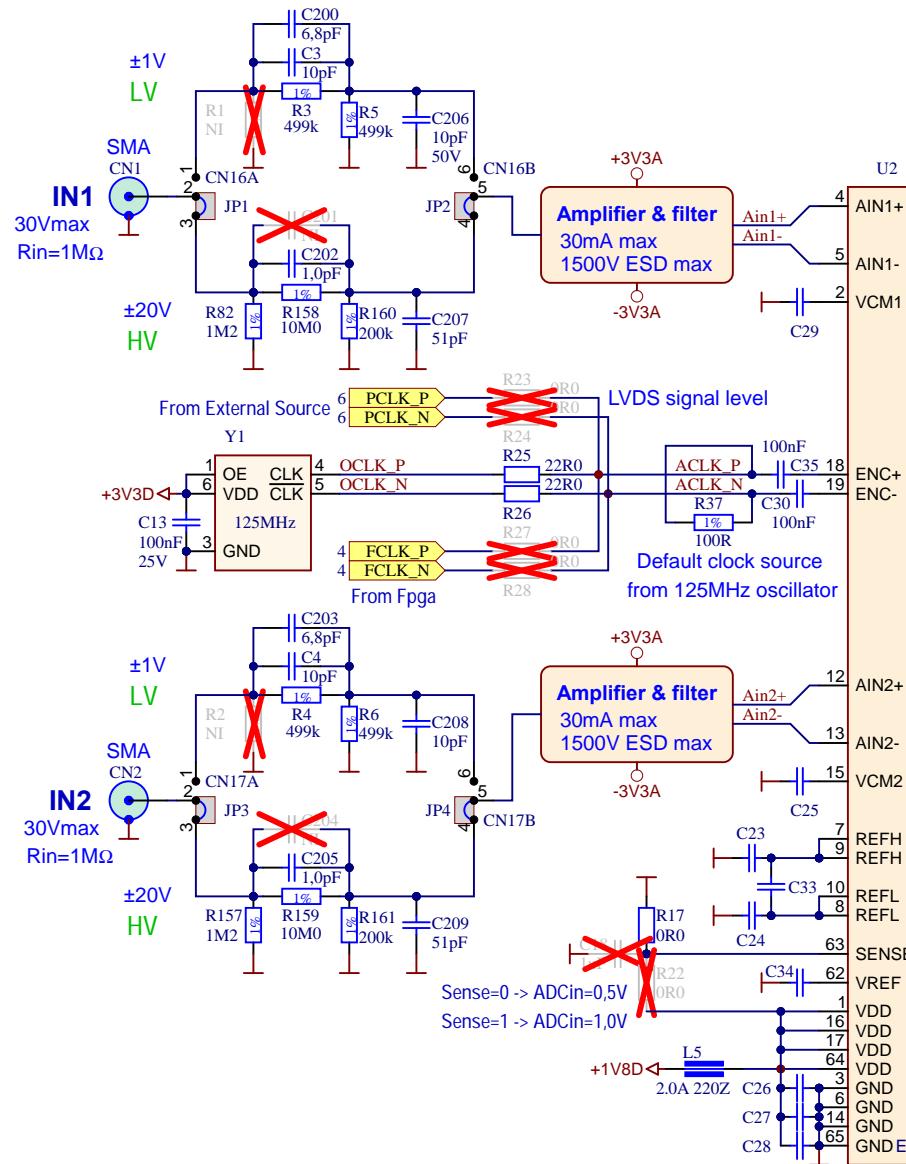
RED PITAYA HEREBY DISCLAIMS ALL WARRANTIES OR LIABILITY OF ANY KIND WITH RESPECT THERETO, INCLUDING, WITHOUT LIMITATION, REPRESENTATIONS REGARDING ACCURACY AND COMPLETENESS, ALL IMPLIED WARRANTIES AND CONDITIONS OF MERCHANTABILITY, SUITABILITY OR FITNESS FOR A PARTICULAR PURPOSE, TITLE AND/OR NON-INFRINGEMENT.

This material is not designed, intended or authorized for use in any applications in which the failure of the product could result in personal injury, death or property damage.

Any party using or selling products for use in any such applications do so at their sole risk and agree that Red Pitaya is not liable, in whole or in part, for any claim or damage arising from such use, and agree to fully indemnify, defend and hold harmless Red Pitaya from and against any and all claims, damages, loss, cost, expense or liability arising out of or in connection with the use or performance of products in such applications.

**Red Pitaya STEMlab 125-14 V1.1 block schematics**


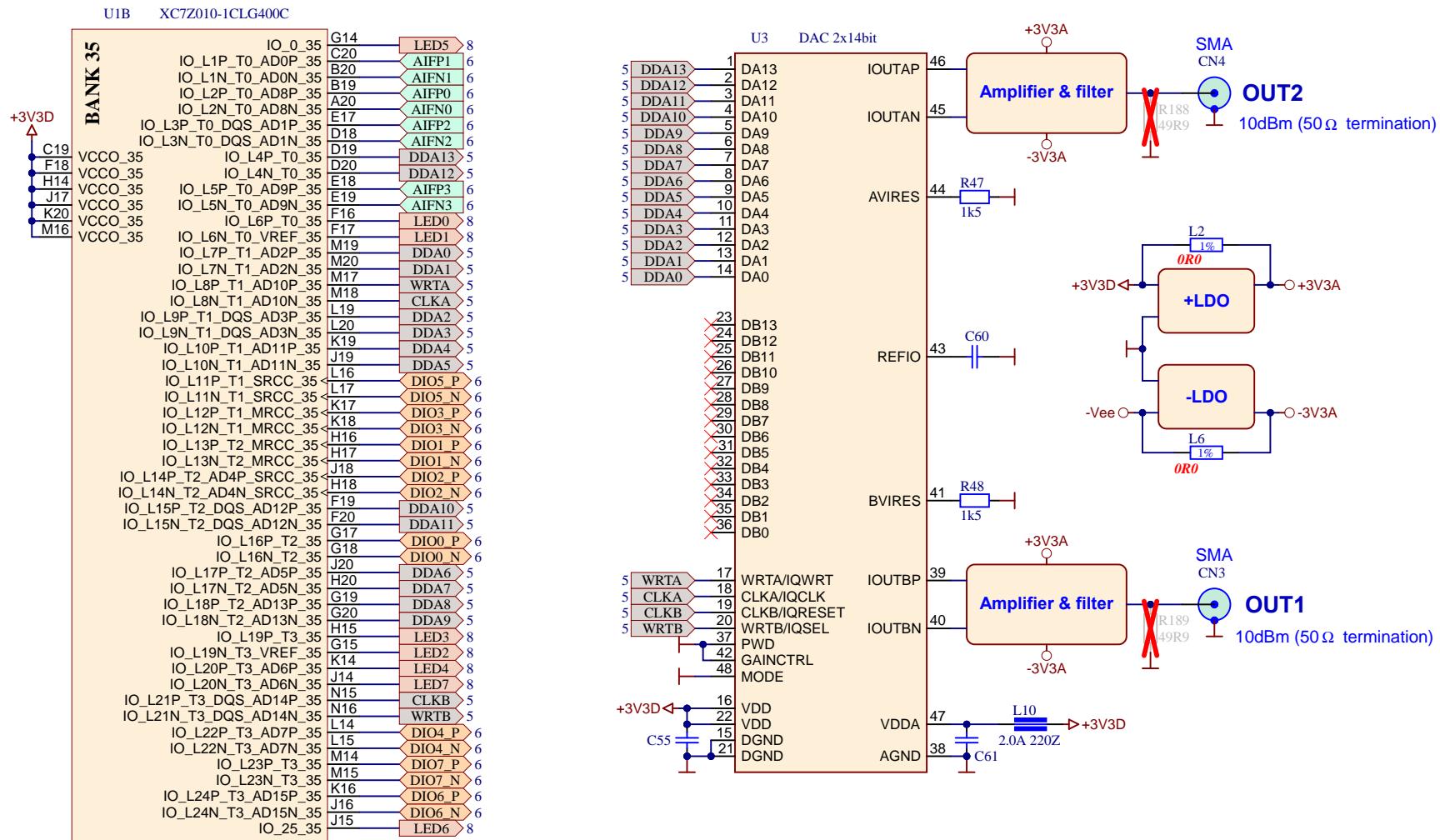
## 2 Analog front-end and AD converter, Zynq bank 34



Note: number next to port symbol indicates the sheet where the signal is connected

Red Pitaya is a registered trademark. Use of the Red Pitaya name must be compliant with <http://www.redpitaya.com/trademark-rules/>

## 3 DA converter and analog back-end, Zynq bank 35

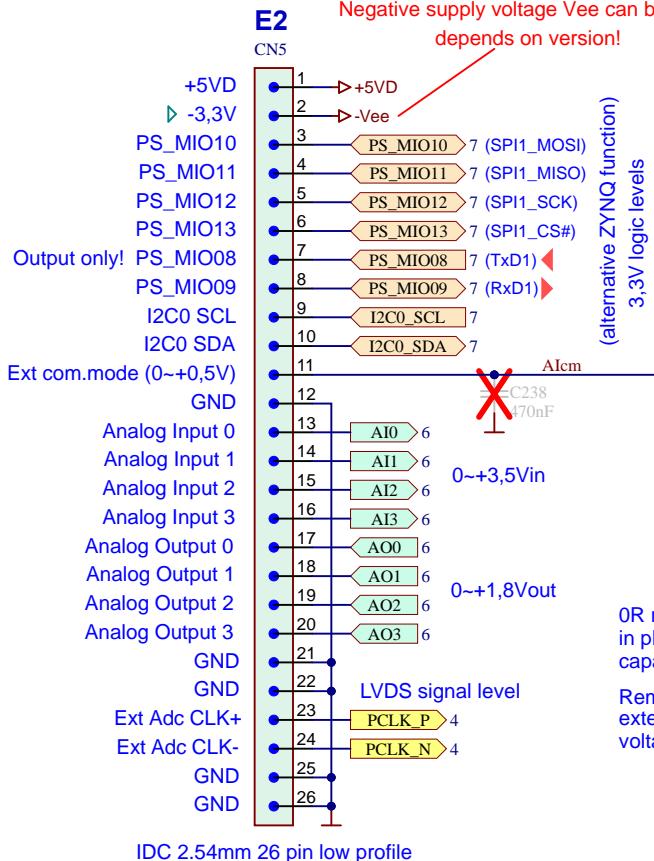


Note: number next to port symbol indicates the sheet where the signal is connected

Red Pitaya is a registered trademark. Use of the Red Pitaya name must be compliant with <http://www.redpitaya.com/trademark-rules/>

## 4 Digital and analog slow I/O, Zynq bank 13

PS\_MIO08 is output only and at power-up must be low level (no external pull-ups)!



(alternative ZYNQ function)

0,5V XADC range

+3V3D

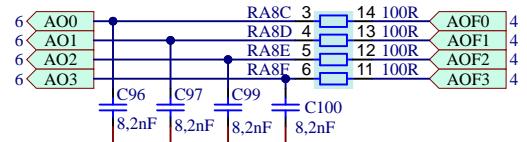
3,3V logic levels

V<sub>cm</sub>=0V

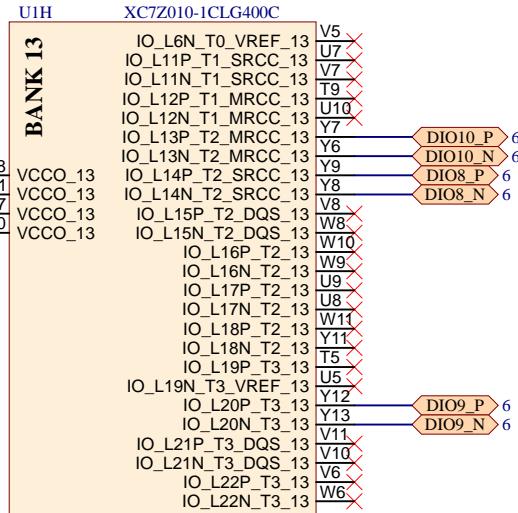
common voltage setup

0R resistor  
in place of  
capacitor

Remove if  
external common mode  
voltage is used!

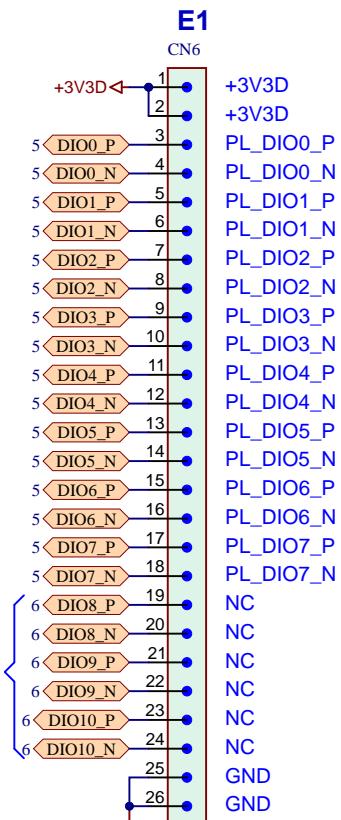


The circuit diagram illustrates a power supply voltage monitor. It begins with a bridge rectifier connected to a +5VDC source. The output of the rectifier passes through two filter capacitors: C184 (10nF) and C185 (10nF). The resulting signal is fed into two operational amplifiers, AIFP4 and AIFN4. AIFP4 is configured as a non-inverting amplifier with a gain of 8, while AIFN4 is configured as an inverting amplifier with a gain of 8. The input to AIFP4 is connected to ground via R141 (1kΩ) and R142 (499Ω). The input to AIFN4 is connected to ground via R139 (56kΩ) and R140 (1kΩ).



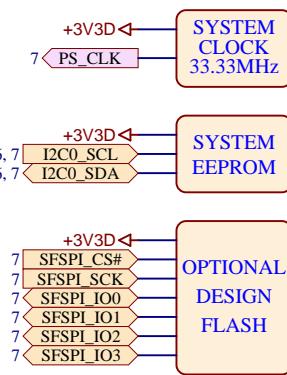
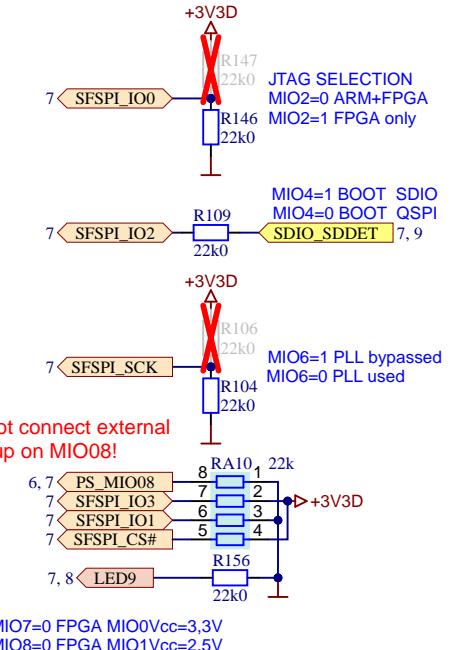
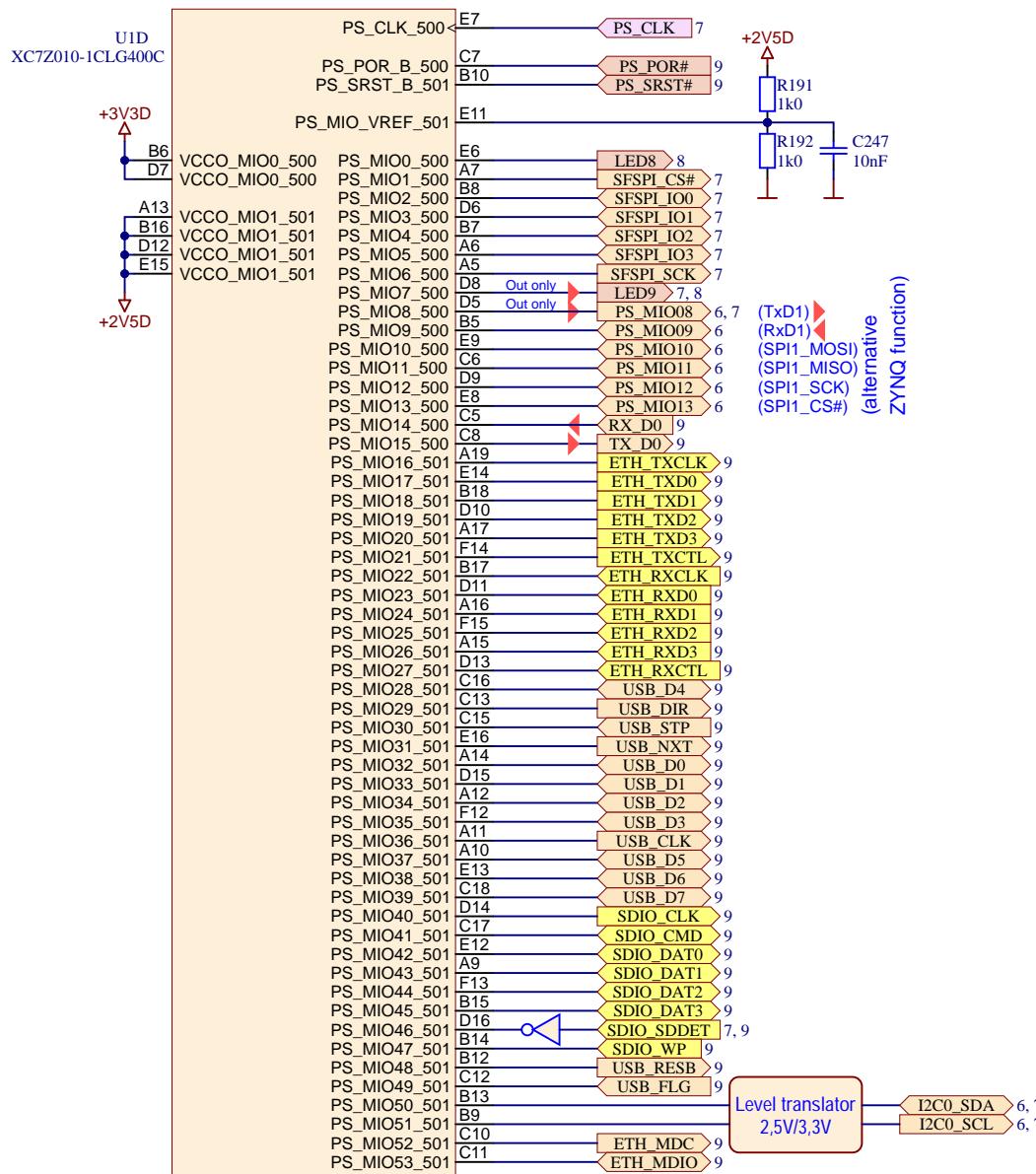
- ▶ ZYNQ dummy Bank 13 in XC7Z010
- ▶ for XC7Z020 connecting compatibility only

► Not connected in XC7Z010

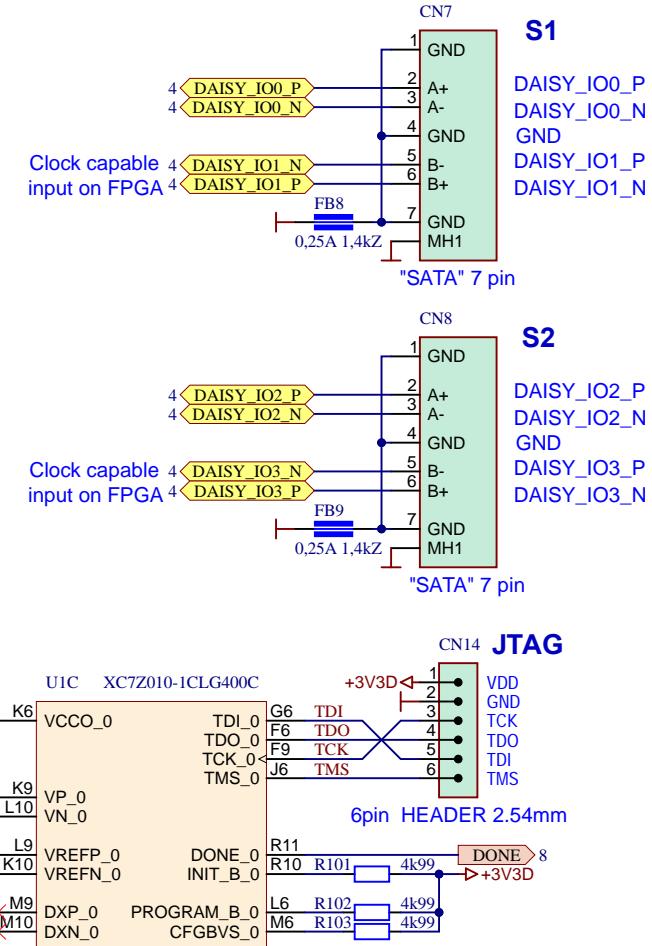
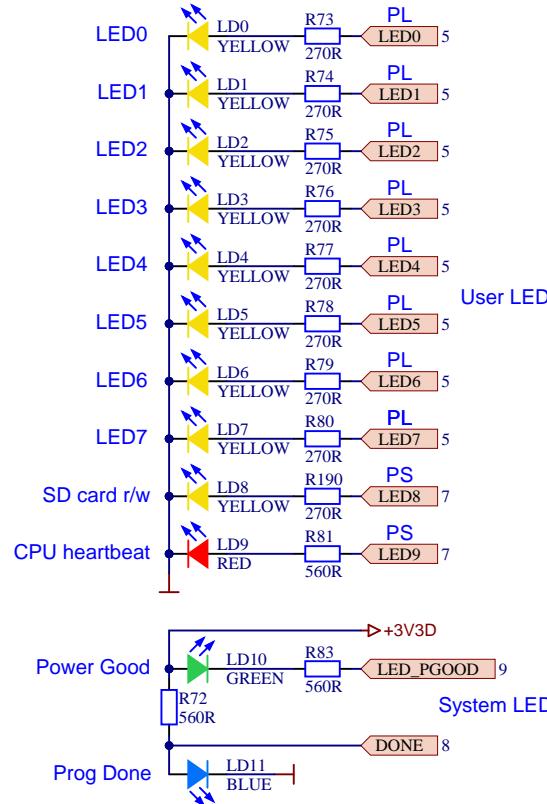


IDC 2.54mm 26 pin low profile

## 5 Zynq bank 500 and 501 (PS)



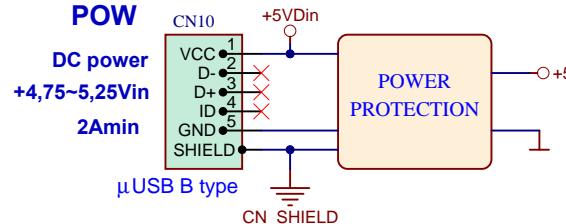
## 6 LED, Serial interface, JTAG



Note: number next to port symbol indicates the sheet where the signal is connected

Red Pitaya is a registered trademark. Use of the Red Pitaya name must be compliant with <http://www.redpitaya.com/trademark-rules/>

## 7 Ethernet, memory card, Console, USB OTG, DDR3, Power

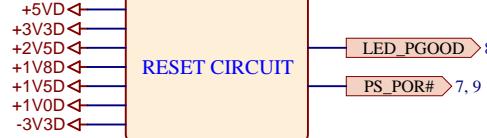
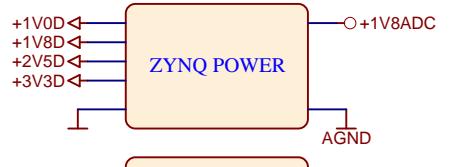
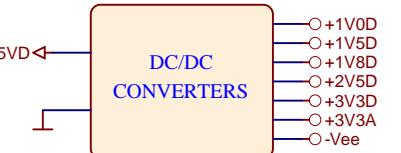
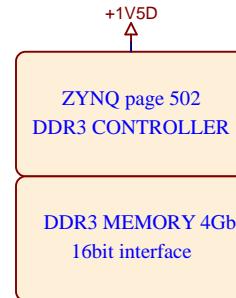
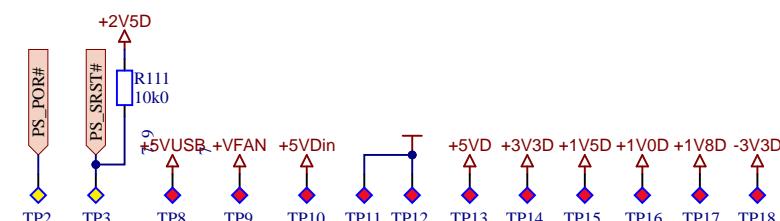
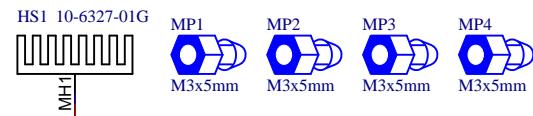
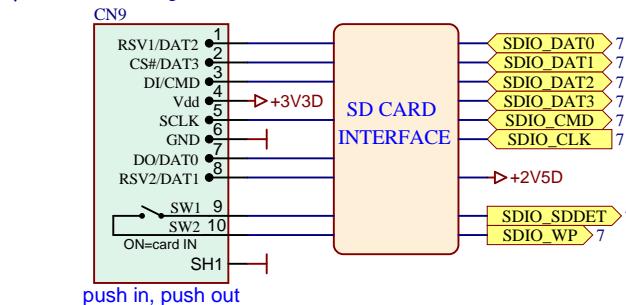


R164 defined for fan 3,3V 40mA,  
change resistance for different  
fan voltage/current

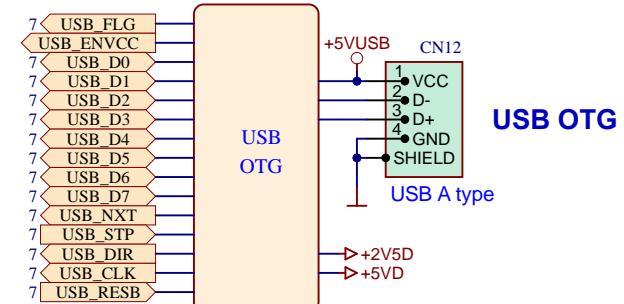
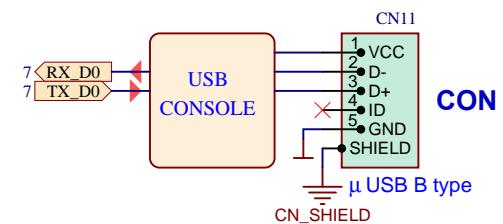
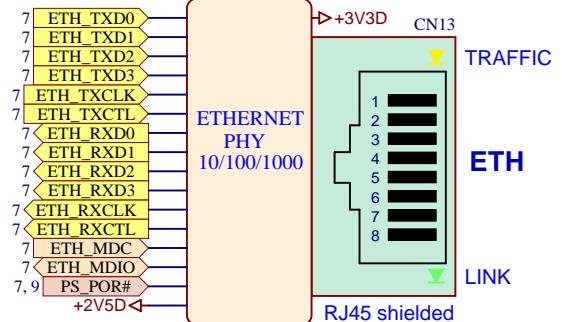
FAN

CN15: +VFAN, -  
2pin HEADER 2.54mm

L13: 47uH, 22uF, 10V  
R164: 39R, (1206), 250mW

**μSD memory card**


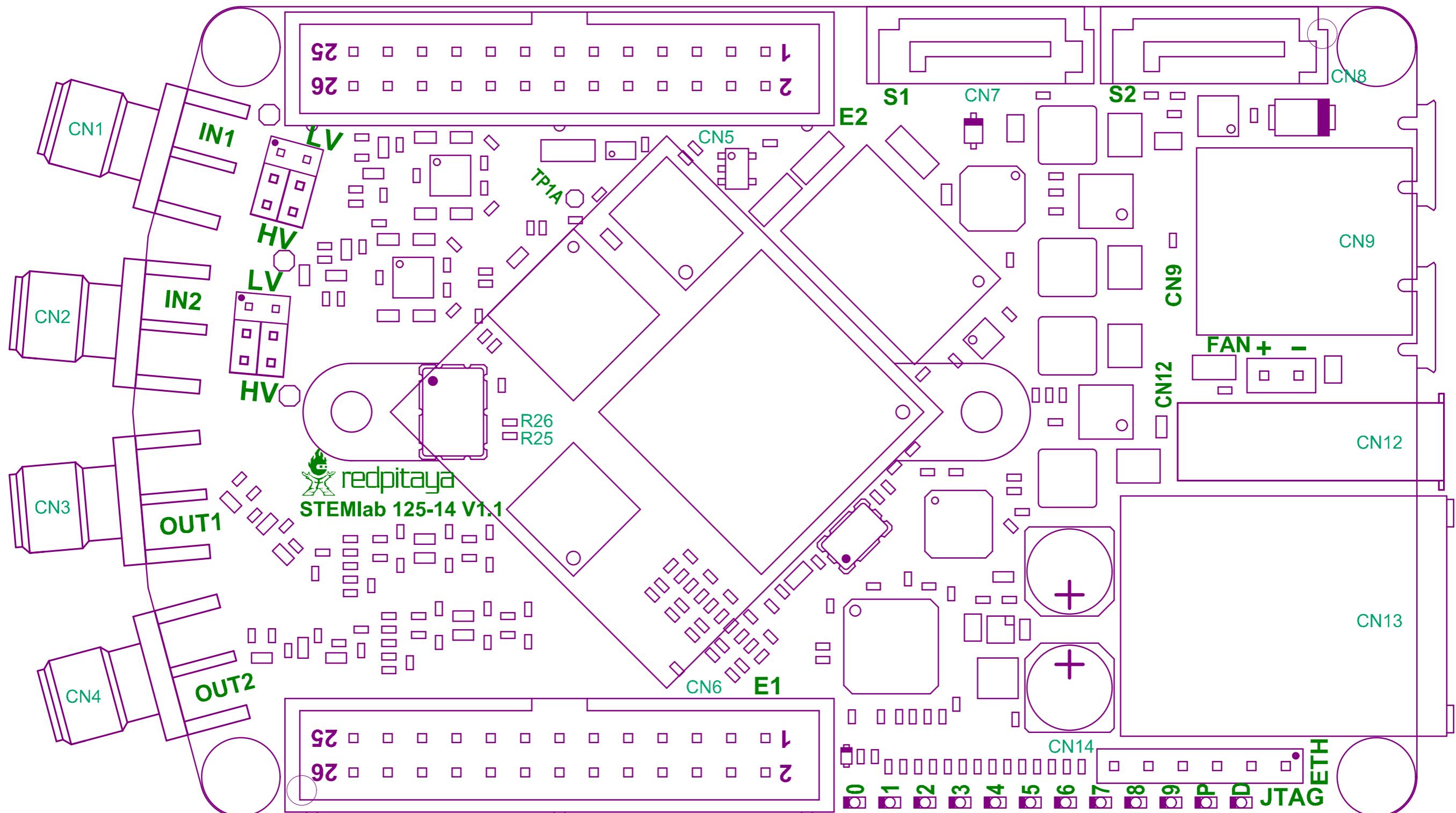
All power supply voltages must be within tolerances  
to activate Power Good and Power-On Reset signal



Note: number next to port symbol indicates the sheet where the signal is connected

Red Pitaya is a registered trademark. Use of the Red Pitaya name must be compliant with <http://www.redpitaya.com/trademark-rules/>

# Top assembly: STEMlab\_125-14\_V1.1 variant: STEMlab 125-14



SD card r/w LED  
CPU HEARTBEAT LED  
POWER LED  
PROG DONE LED

Bottom assembly: STEMlab\_125-14\_V1.1 variant: STEMlab 125-14

