Table of Content

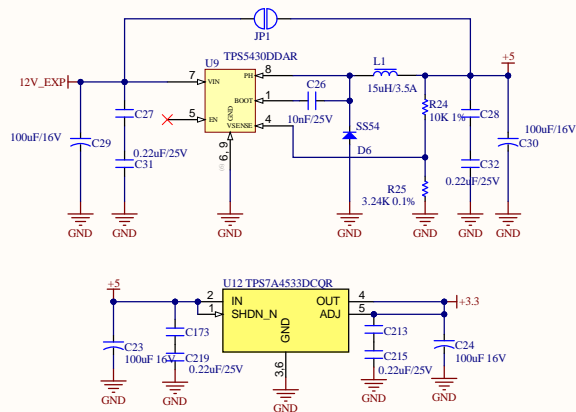# NANORACK PHOTODIODE

Schematic V1.1.0

Cannot open file C:\Users\Public\Documents\Altium\AD21\Templates\SLT CI\SLT CI_좌우.png. File does not exist.

Project: BEE-PC1	Sub-system: NANORACK_PHOTODIODE.PrjPcb	
Design by: Hung Nguyen D.	Sheet title: INDEX.SchDoc	Sheet 1 of 5
Checked by: Bao Bui Q.	Document No: 1	Size: A3
Approved by: Vu Pham	Revision: V1.1.0	Date: 1/15/2025

Cannot open file D:\WorkSpace\Altium\NANORACK\PHOTODIODE V1.2.0\01_DESIGN\BLOCK.png. File does not exist.

Project: BEE-PC1

Sub-system: NANORACK_PHOTODIODE.PrjPcb

Design by: Hung Nguyen D.

Sheet title: BLOCK_DIAGRAM.SchDoc

Sheet 2 of 5

Checked by: Bao Bui Q.

Document No: 2

Size: A3

Approved by: Vu Pham

Revision: V1.1.0

Date: 1/15/2025

POWER SWITCH AND LDO

U9 TPS5430DDAR

- 12V_EXP
- C27
- 100uF/16V — C29
- 0.22uF/25V — C31
- C26 10nF/25V
- L1 15uH/3.5A
- SS54 D6
- R24 10K 1%
- R25 3.24K 0.1%
- C28
- 100uF/16V — C30
- C32 0.22uF/25V
- +5

Pins: 7 VIN, PH 8, BOOT 1, EN 5, VSENSE 4, GND 6,9

U12 TPS7A4533DCQR

- +5
- C173
- C23 100uF 16V
- C219 0.22uF/25V
- C213
- C215 0.22uF/25V
- C24 100uF 16V
- +3.3

Pins: IN 2, SHDN_N 1, GND 3,6, OUT 4, ADJ 5

GND

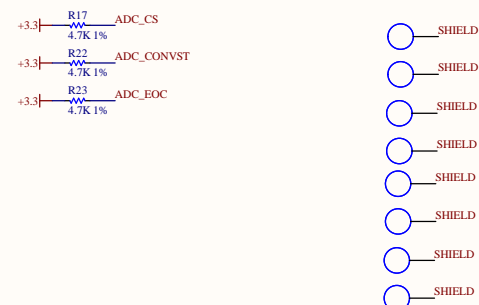| Project: BEE-PC1	Sub-system: NANORACK_PHOTODIODE.PrjPcb	
Design by: Hung Nguyen D.	Sheet title: POWER SWITCH AND LDO.SchDoc	Sheet 3 of 5
Checked by: Bao Bui Q.	Document No: 3	Size: A3
Approved by: Vu Pham	Revision: V1.1.0	Date: 1/17/2025

CONNECTOR

Molex - 0532610971

- ELECTRICAL:
  CURRENT RATING: 1A/CONTACT
  VOLTAGE RATING: 125V/CONTACT
- ENVIRONMENTAL:
  TEMPERATURE RANGE: -40°C TO +105°C
- PHYSICAL:
  PITCH-MATING: 0.049" (1.25mm)
- WIRE:
  WIRE SIZE: 24 AWG
  MAX CURRENT: 1A per Wire
  ISULATION MATERIAL: PTFE
- MATING:
  Molex - 0510210900
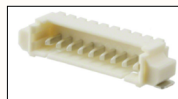
- MATING -

0510210900

ADC

Project:	BEE-PC1	Sub-system:	NANORACK_PHOTODIODE.PrjPcb		
Design by:	Hung Nguyen D.	Sheet title:	COMMUNICATION.SchDoc	Sheet 4	of 5
Checked by:	Bao Bui Q.	Document No:	4	Size:	A3
Approved by:	Vu Pham	Revision:	V1.1.0	Date:	1/17/2025

SWITCHING
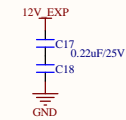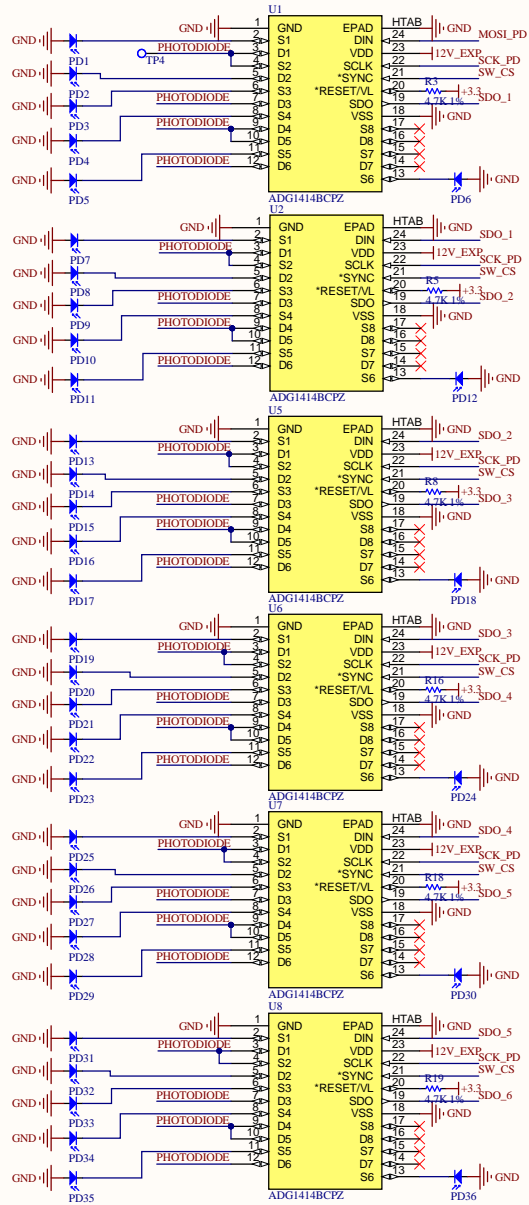
TRANSIMPEDANCE, ANTI ALIAS

VREF
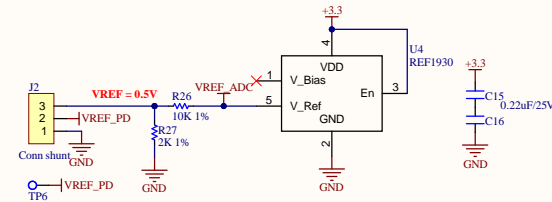
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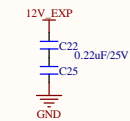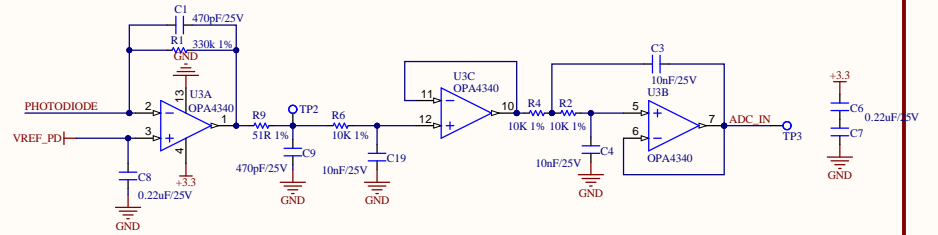|	
Project: BEE-PC1	Sub-system: NANORACK_PHOTODIODE.PrjPcb
Design by: Hung Nguyen D.	Sheet title: PHOTODIODE.SchDoc
Checked by: Bao Bui Q.	Document No: 5
Approved by: Vu Pham	Revision: V1.1.0

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Size: A3
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U1 ADG1414BCPZ
U2 ADG1414BCPZ
U5 ADG1414BCPZ
U6 ADG1414BCPZ
U7 ADG1414BCPZ
U8 ADG1414BCPZ

Pins: GND, S1, D1, S2, D2, S3, D3, S4, D4, S5, D5, S6
EPAD, DIN, VDD, SCLK, *SYNC, *RESET/VL, SDO, VSS, S8, D8, S7, D7

Signals: MOSI_PD, 12V_EXP, SCK_PD, SW_CS, SDO_1, SDO_2, SDO_3, SDO_4, SDO_5, SDO_6
PHOTODIODE, GND, +3.3

PD1–PD36

TP4

R3 4.7K 1%, R5 4.7K 1%, R8 4.7K 1%, R16 4.7K 1%, R18 4.7K 1%, R19 4.7K 1%

C2 0.22uF/25V, C5, C10 0.22uF/25V, C11, C12 0.22uF/25V, C13, C17 0.22uF/25V, C18, C20 0.22uF/25V, C21, C22 0.22uF/25V, C25

R7 4.7K 1% SDO_1, R10 4.7K 1% SDO_2, R11 4.7K 1% SDO_3, R14 4.7K 1% SDO_4, R15 4.7K 1% SDO_5, R20 4.7K 1% SDO_6, +3.3
TP1

TRANSIMPEDANCE, ANTI ALIAS section:
C1 470pF/25V
R1 330k 1%
U3A OPA4340
PHOTODIODE
VREF_PD
C8 0.22uF/25V
R9 51R 1%
C9 470pF/25V
TP2
R6 10K 1%
C19 10nF/25V
U3C OPA4340
R4 10K 1%
R2 10K 1%
C4 10nF/25V
C3 10nF/25V
U3B OPA4340
ADC_IN
TP3
C6 0.22uF/25V
C7
+3.3
GND

VREF section:
+3.3
U4 REF1930
VDD, V_Bias, En, V_Ref, GND
J2 Conn shunt
VREF = 0.5V
R26 10K 1%
R27 2K 1%
VREF_ADC
VREF_PD
C15 0.22uF/25V
C16
+3.3
TP6 VREF_PD
GND

Space ClinTech

PROJECT BEE-PC1
NANDRACK PHOTODIODE V1.1.0

U1

R6
R7
C2
C5

R5
R10
C10
C11

R8
R11
C12
C13

R16
R14
C17
C18

R18
R15
C20
C21

R19
R20
C22
C25

D5
D4
D3
D2
D1

TP6   TP1   TP10
C8
C7
C6
C4

TP3   TP4   TP2

TP9   TP8   TP7
R12
C14

TP12 TP11 TP13
R13
C35

R9
C24   C30   C23

D6

U12

R4

C28

U10

R26   U4   C15
C16

Vref = 0V   Vref = 0.5V