NANORACK PHOTODIODE

Schematic V1.2.1

Table of Content

History

VERSION	DISCRIPTION
1.0.0	INITIAL PROJECT
1.1.0	REPLACE SWITCHING OBJECT
1.1.1	CHANGE SUPPLY POWER SWITCHING
1.1.2	CHANGE EPAD PIN OF SWITCH TO VSS
1.2.0	ADD HOLES (CENTER OF SIDES)
1.2.1	CHANGE ADG1414 CATEGORY

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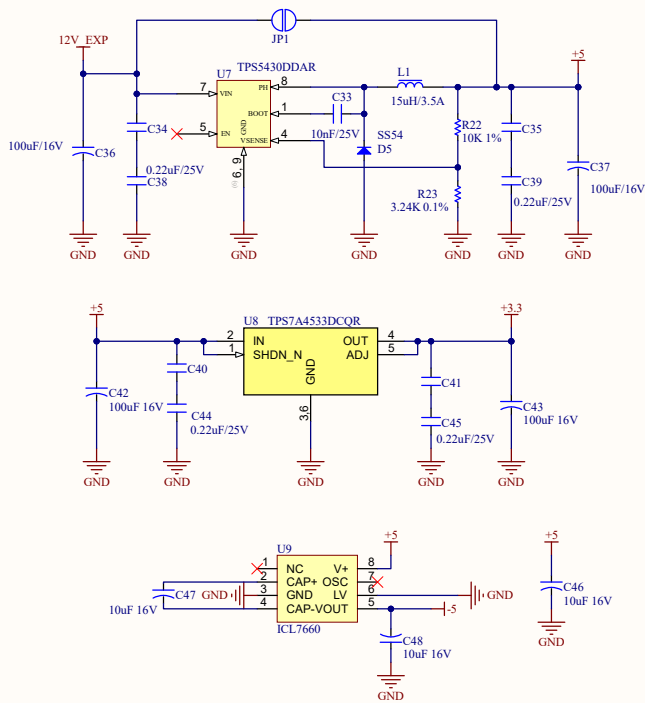
Project: BEE-PC1	Sub-system: NANORACK_PHOTODIODE.PrjPcb	
Design by: Hung Nguyen D.	Sheet title: INDEX.SchDoc	Sheet 1 of 5
Checked by: Bao Bui Q.	Document No: 1	Size: A3
Approved by: Vu Pham	Revision: V1.2.1	Date: 25/5/25

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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:	V1.2.1	Date:	25/5/25

POWER SWITCH AND LDO

U7 TPS5430DDAR

12V_EXP

100uF/16V C36

C34
0.22uF/25V
C38

L1
15uH/3.5A

C33
10nF/25V

SS54
D5

R22
10K 1%

C35

C39
0.22uF/25V

+5

C37
100uF/16V

R23
3.24K 0.1%

JP1

GND GND GND GND GND GND GND

U8 TPS7A4533DCQR

+5

C42
100uF 16V

C40

C44
0.22uF/25V

IN   OUT
SHDN_N   ADJ
    GND

+3.3

C41

C45
0.22uF/25V

C43
100uF 16V

GND GND GND GND GND

U9

NC   V+
CAP+   OSC
GND   LV
CAP-   VOUT

ICL7660

+5   +5

C47 GND
10uF 16V

GND

C46
10uF 16V

-5

GND

C48
10uF 16V

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.

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Size: A3

Approved by: Vu Pham

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Date: 4/9/25

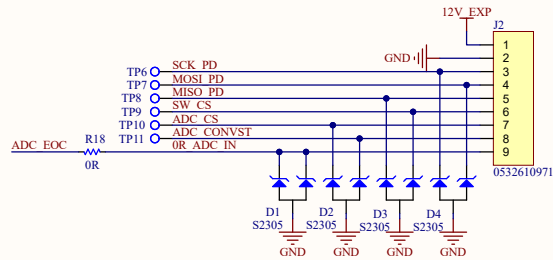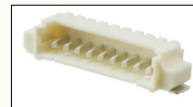Cannot open file C:\Users\Public\Documents\Altium\AD21\Templates\SLT CI\SLT CI_좌우.png. File does not exist.

CONNECTOR

ADC

J2 12V_EXP
0532610971

TP6 SCK_PD
TP7 MOSI_PD
TP8 MISO_PD
TP9 SW_CS
TP10 ADC_CS
TP11 ADC_CONVST
ADC_EOC — R18 0R — 0R_ADC_IN

GND

D1 S2305
D2 S2305
D3 S2305
D4 S2305
GND GND GND GND

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
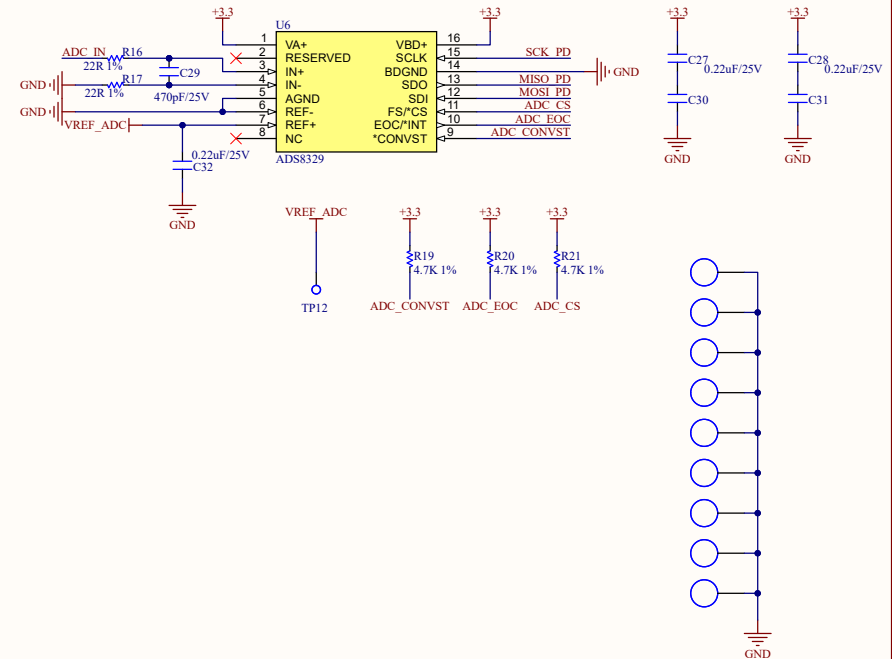
U6
ADS8329

+3.3
ADC_IN — R16 22R 1%
R17 22R 1%
C29 470pF/25V
GND
GND
VREF_ADC

1 VA+ | VBD+ 16
2 RESERVED | SCLK 15
3 IN+ | BDGND 14
4 IN- | SDO 13
5 AGND | SDI 12
6 REF- | FS/*CS 11
7 REF+ | EOC/*INT 10
8 NC | *CONVST 9

SCK_PD
GND
MISO_PD
MOSI_PD
ADC_CS
ADC_CONVST

C32 0.22uF/25V
GND

+3.3
C27 0.22uF/25V
C30
GND

+3.3
C28 0.22uF/25V
C31
GND

VREF_ADC

TP12

+3.3
R19 4.7K 1%
ADC_CONVST

+3.3
R20 4.7K 1%
ADC_EOC

+3.3
R21 4.7K 1%
ADC_CS

GND

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: **V1.2.1** — Date: **14/9/25**

SWITCHING

+3.3 R1 SDO_3
4.7K 1%

U2
GND DIN
S1 VDD
D1 SCLK
S2 *SYNC
D2 *RESET/VL
S3 SDO
D3 VSS
S4 D8
D4 S8
S5 D7
D5 S7
S6 D6
ADG1414BRUZ

PD5 PHOTODIODE
PD6 PHOTODIODE
PD7 PHOTODIODE
PD8 PHOTODIODE
PD4
PD3
GND
TP3

12V_EXP +3.3
SCK_PD
SW_CS
SDO_3
R6 4.7K 1%
-5
PHOTODIODE
PHOTODIODE
PHOTODIODE
PD1
PD2
GND

12V_EXP
C2 0.22uF/25V
C5
GND

-5
C3 0.22uF/25V
C6
GND

+3.3 R9 SDO_2
4.7K 1%

U3
GND DIN
S1 VDD
D1 SCLK
S2 *SYNC
D2 *RESET/VL
S3 SDO
D3 VSS
S4 D8
D4 S8
S5 D7
D5 S7
S6 D6
ADG1414BRUZ

PD13 PHOTODIODE
PD14 PHOTODIODE
PD15 PHOTODIODE
PD16 PHOTODIODE
PD12
PD11
GND

12V_EXP +3.3
SCK_PD
SW_CS
SDO_2
R10 4.7K 1%
-5
PHOTODIODE
PHOTODIODE
PHOTODIODE
PD9
PD10
GND

12V_EXP
C14 0.22uF/25V
C16
GND

-5
C15 0.22uF/25V
C17
GND

+3.3 R14 SDO_1
4.7K 1% TP5

U5
GND DIN
S1 VDD
D1 SCLK
S2 *SYNC
D2 *RESET/VL
S3 SDO
D3 VSS
S4 D8
D4 S8
S5 D7
D5 S7
S6 D6
ADG1414BRUZ

PD21 PHOTODIODE
PD22 PHOTODIODE
PD23 PHOTODIODE
PD24 PHOTODIODE
PD20
PD19
GND

12V_EXP +3.3
SCK_PD
SW_CS
SDO_1
R15 4.7K 1%
-5
PHOTODIODE
PHOTODIODE
PHOTODIODE
PD17
PD18
GND

12V_EXP
C23 0.22uF/25V
C25
GND

-5
C24 0.22uF/25V
C26
GND

MOSI_PD

TRANSIMPEDANCE, ANTI ALIAS
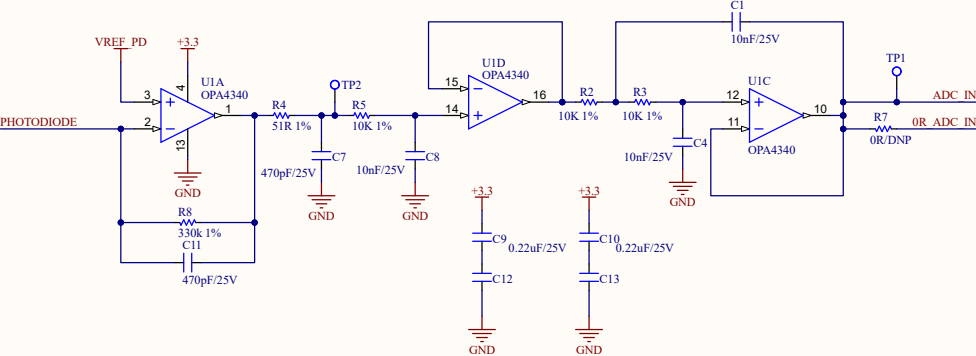
VREF_PD +3.3
PHOTODIODE
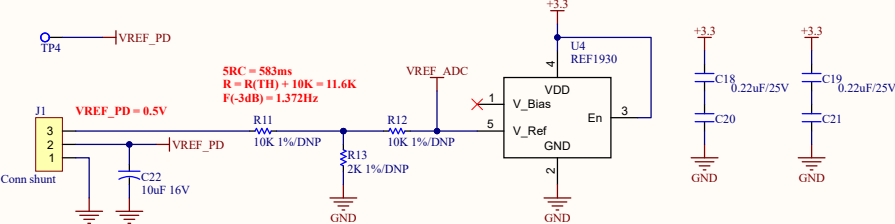
U1A OPA4340
R4 51R 1%
C7 470pF/25V
GND

TP2
R5 10K 1%
C8 10nF/25V
GND

U1D OPA4340
R2 10K 1%
R3 10K 1%
C4
10nF/25V
GND

U1C OPA4340
C1 10nF/25V
TP1
R7 0R/DNP
ADC_IN
0R_ADC_IN

R8 330k 1%
C11 470pF/25V
GND

+3.3
C9 0.22uF/25V
C12
GND

+3.3
C10 0.22uF/25V
C13
GND

VREF

TP4 VREF_PD

J1
3
2
1
Conn shunt

VREF_PD = 0.5V

5RC = 583ms
R = R(TH) + 10K = 11.6K
F(-3dB) = 1.372Hz

C22 10uF 16V
GND

VREF_PD
R11 10K 1%/DNP
R13 2K 1%/DNP
GND

R12 10K 1%/DNP
GND

VREF_ADC

U4 REF1930
VDD
V_Bias En
V_Ref
GND
+3.3

+3.3
C18 0.22uF/25V
C20
GND

+3.3
C19 0.22uF/25V
C21
GND

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