

A

A

B

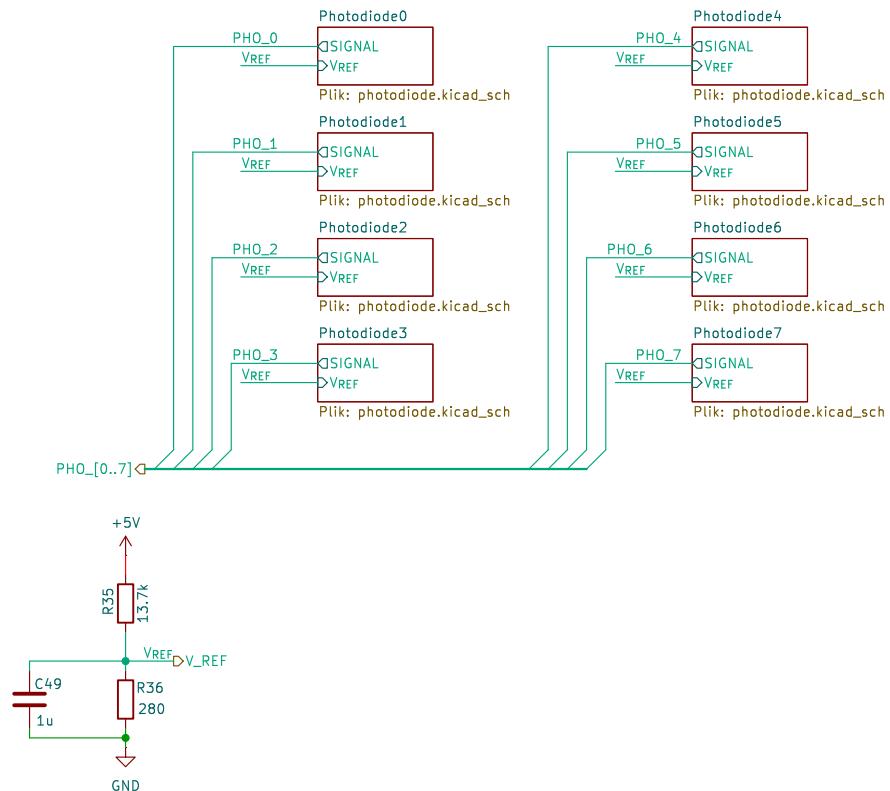
B

C

C

D

D



Original author: Oliwier Woźniak

Sheet: /Photodiodes/
File: photodiodes_all.kicad_sch**Title: uMule_board**Size: A4 Date: 2025-12-14
KiCad E.D.A. 9.0.7Rev: 1.0
Id: 21/14

Można zastanowić się nad zmianą wartości rezystora R1, ale to po zmianie procka i sprawdzeniu czy będzie działać. Obecnie jest zakres 0.1V–2.4V (chyba)

$$\frac{V_{OUT(MAX)} - V_{OUT(MIN)}}{I_{IN(MAX)}} = R_1 \rightarrow \frac{4.9V - .1V}{90\mu A} = 53333.3\Omega \rightarrow 53.6k\Omega$$

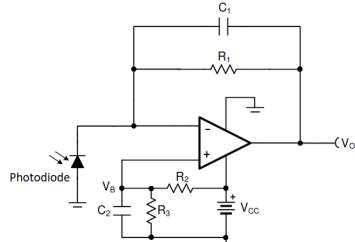
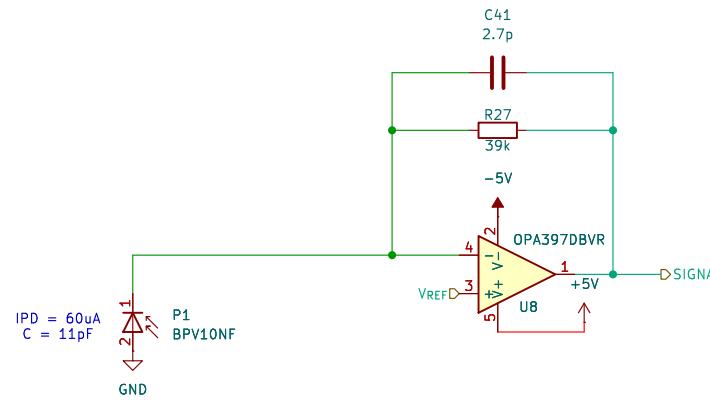


Figure 4: A bias voltage is applied to the op amp's non-inverting input to prevent saturation at the negative power supply

The output transfer function including the bias voltage is:

$$V_{OUT} = i_{PD}R_1 + V_B = i_{PD}R_1 + V_{CC} \frac{R_3}{R_3 + R_2} \quad (2)$$

KEY OPA128 SPECIFICATIONS

Bias current	75fA max
Offset voltage	500 μ V max
Drift	5 μ V/ $^{\circ}$ C max
Noise	15nV/ \sqrt{Hz} at 10kHz

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Original author: Oliwier Woźniak

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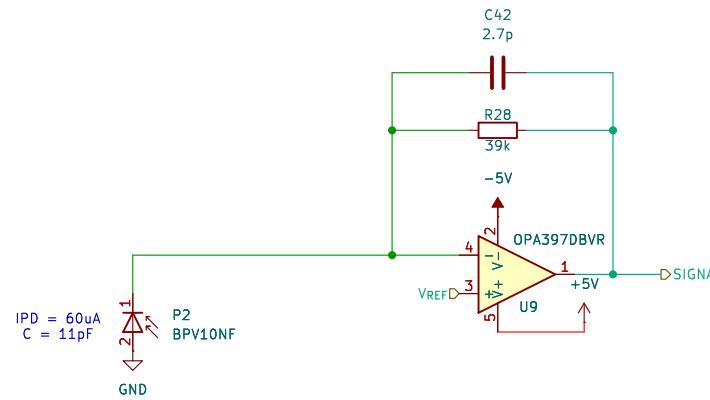
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Size: A4 Date: 2025-12-14
KiCad E.D.A. 9.0.7

Rev: 1.0
Id: 4/14

Można zastanowić się nad zmianą wartości rezystora R1, ale to po zmianie procka i sprawdzeniu czy będzie działać. Obecnie jest zakres 0.1V–2.4V (chyba)

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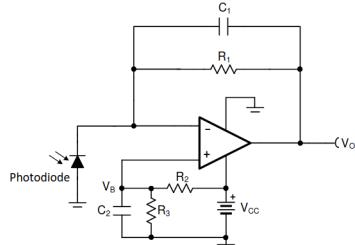


Figure 4: A bias voltage is applied to the op amp's non-inverting input to prevent saturation at the negative power supply

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KEY OPA128 SPECIFICATIONS

Bias current	75fA max
Offset voltage	500μV max
Drift	5μV/°C max
Noise	15nV/√Hz at 10kHz

Original author: Oliwier Woźniak

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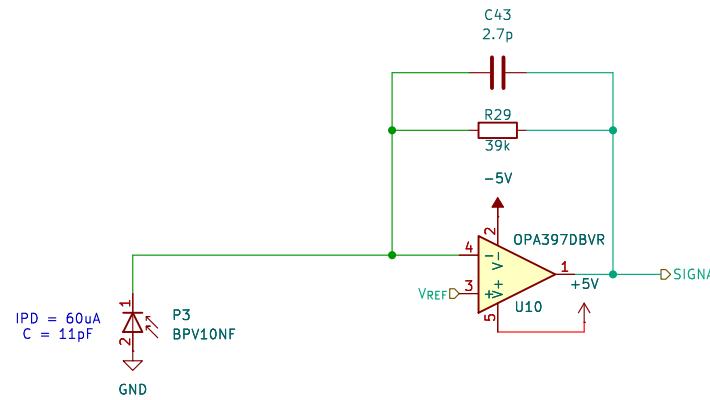
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Size: A4 Date: 2025-12-14
KiCad E.D.A. 9.0.7

Rev: 1.0
Id: 5/14

Można zastanowić się nad zmianą wartości rezystora R1, ale to po zmianie procka i sprawdzeniu czy będzie działać. Obecnie jest zakres 0.1V–2.4V (chyba)

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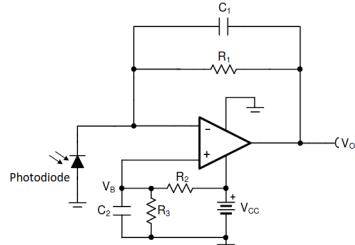


Figure 4: A bias voltage is applied to the op amp's non-inverting input to prevent saturation at the negative power supply

The output transfer function including the bias voltage is:

$$V_{OUT} = i_{PD}R_1 + V_B = i_{PD}R_1 + V_{CC} \frac{R_3}{R_3 + R_2} \quad (2)$$

KEY OPA128 SPECIFICATIONS

Bias current	75fA max
Offset voltage	500μV max
Drift	5μV/°C max
Noise	15nV/√Hz at 10kHz

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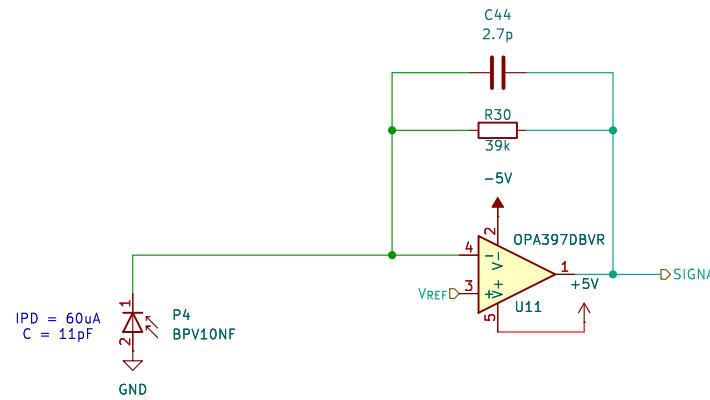
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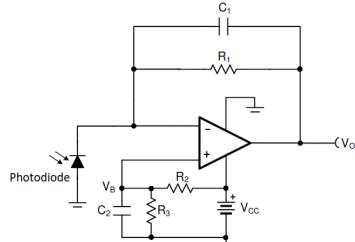


Figure 4: A bias voltage is applied to the op amp's non-inverting input to prevent saturation at the negative power supply

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KEY OPA128 SPECIFICATIONS

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Offset voltage	500μV max
Drift	5μV/°C max
Noise	15nV/√Hz at 10kHz

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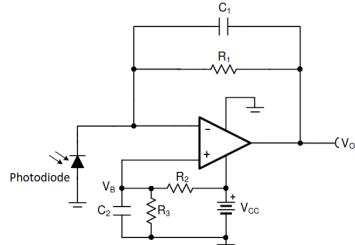
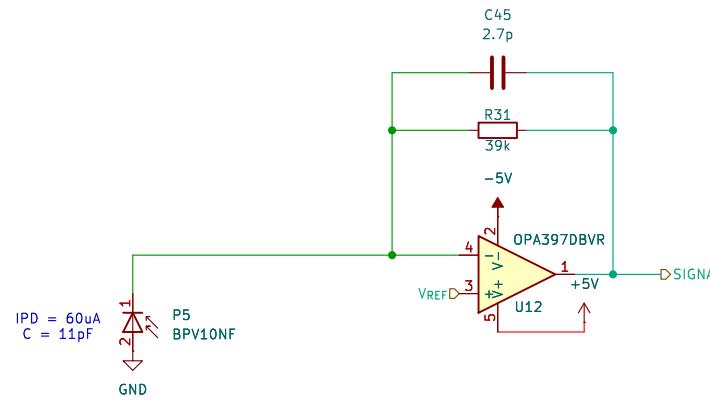


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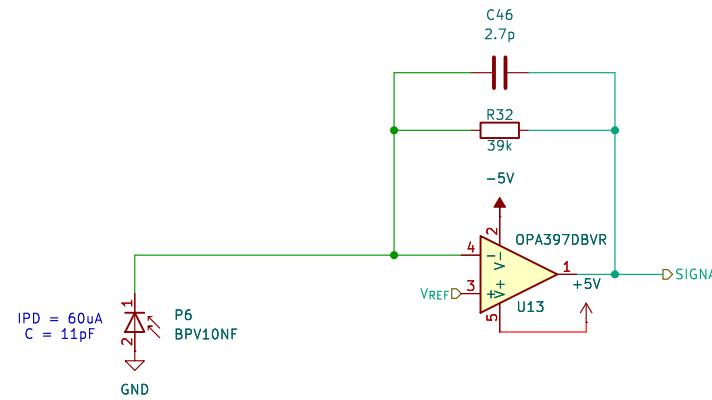
Title: uMule_board

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Rev: 1.0
Id: 8/14

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IPD = 60 μ A
C = 11pF
P6 BPV10NF

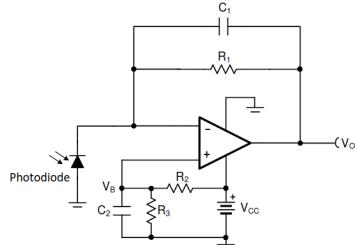


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Original author: Oliwier Woźniak

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Title: uMule_board

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Rev: 1.0
Id: 9/14

Można zastanowić się nad zmianą wartości rezystora R1, ale to po zmianie procka i sprawdzeniu czy będzie działać. Obecnie jest zakres 0.1V–2.4V (chyba)

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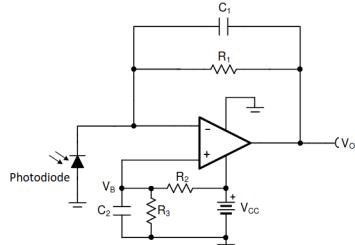
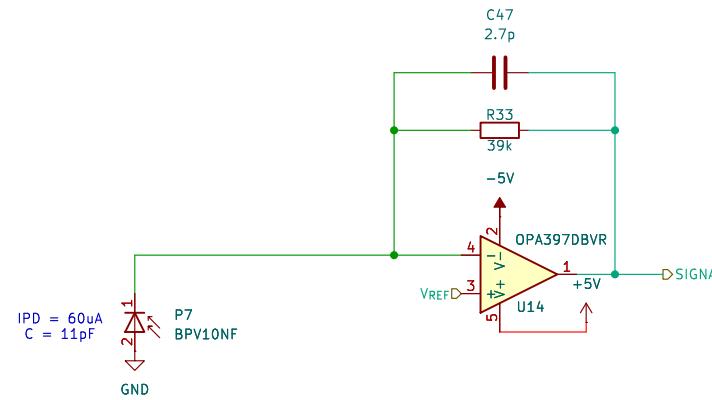


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Original author: Oliwier Woźniak

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Title: uMule_board

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Id: 10/14

Można zastanowić się nad zmianą wartości rezystora R1, ale to po zmianie procka i sprawdzeniu czy będzie działać. Obecnie jest zakres 0.1V–2.4V (chyba)

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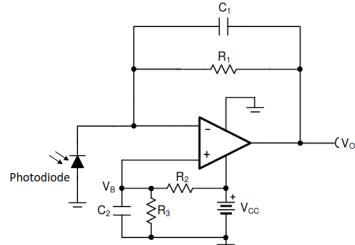
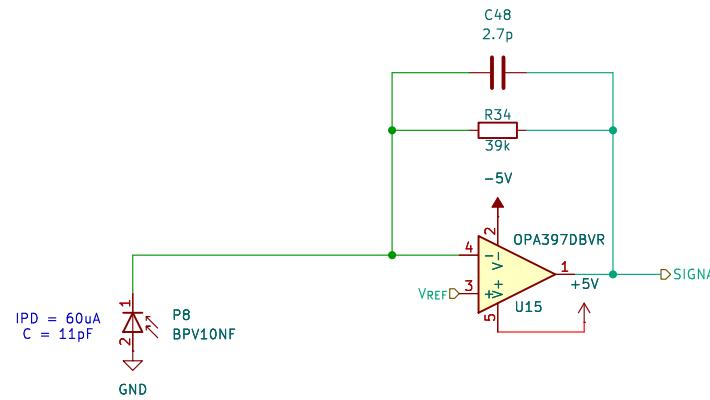


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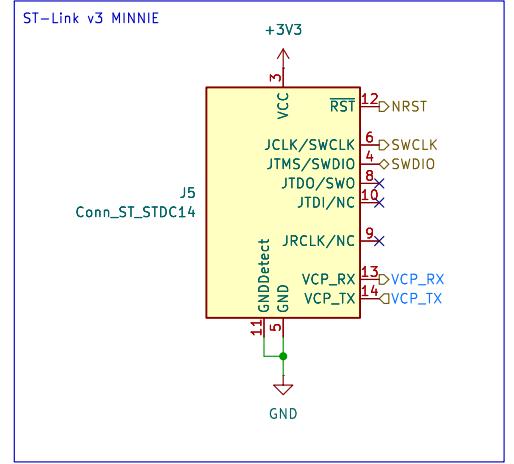
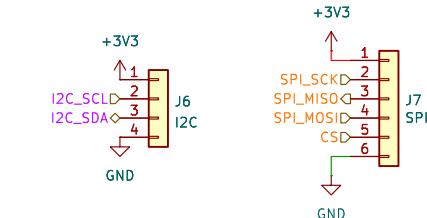
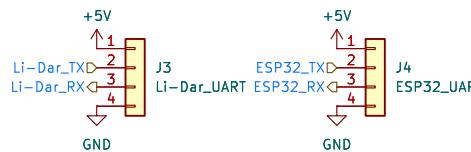
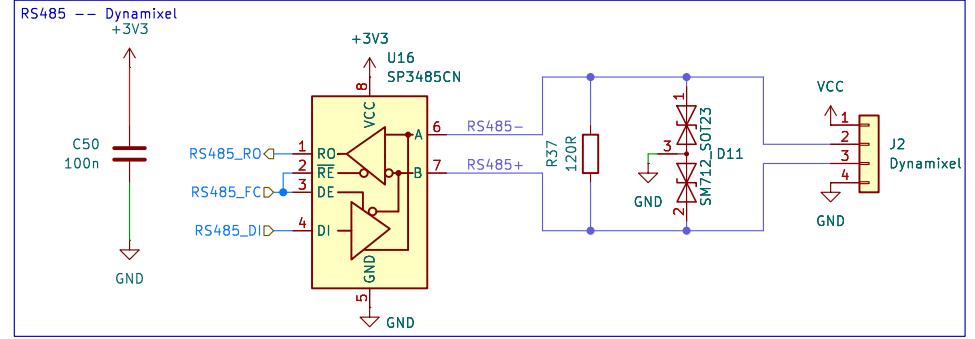
Original author: Oliwier Woźniak

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Title: uMule_board

Size: A4	Date: 2025-12-14
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Rev: 1.0
Id: 11/14



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