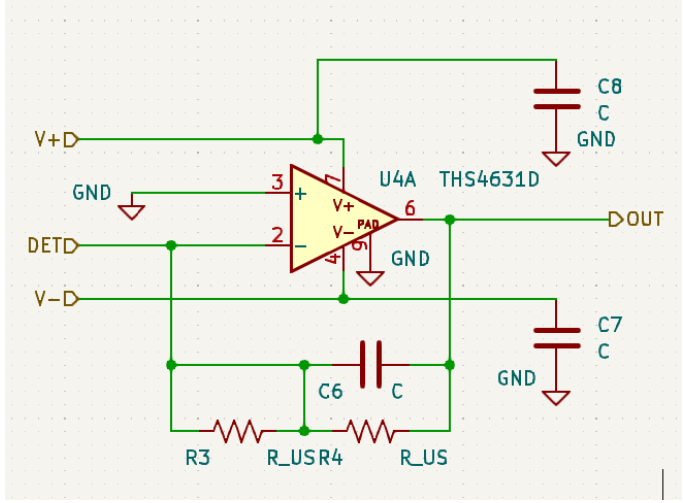
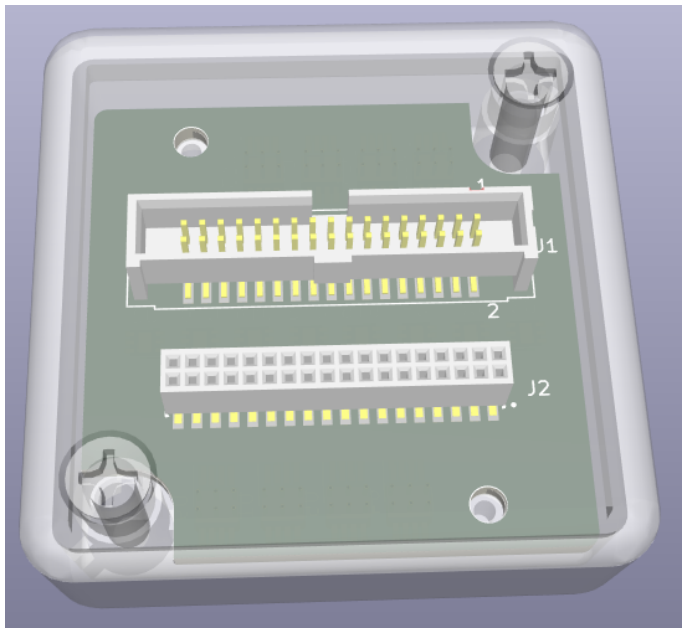
Optode Readout

BU Neurophotonics Center

Specification

- Low-noise transimpedance gain = ??
- Separate LDO for each channel +5V
- Fit in Hammond 1551QGY box





OP-Amp Choice

Tentative op-amp choice:
THS4631

- Low noise
- Small package
- 30V power supply max
- Availability

TEXAS INSTRUMENTS

D–8 DDA–8 DGN–8

THS4631

www.ti.com

SLOS451B – DECEMBER 2004 – REVISED AUGUST 2011

HIGH-VOLTAGE, HIGH SLEW RATE, WIDEBAND FET-INPUT OPERATIONAL AMPLIFIER

Check for Samples: THS4631

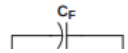
FEATURES

- High Bandwidth:
  - 325 MHz in Unity Gain
  - 210 MHz Gain Bandwidth Product
- High Slew Rate:
  - 900 V/µs (G = 2)
  - 1000 V/µs (G = 5)
- Low Distortion of –76 dB, SFDR at 5 MHz
- Maximum Input Bias Current: 100 pA
- Input Voltage Noise: 7 nV/$\sqrt{\text{Hz}}$
- Maximum Input Offset Voltage: 500 µV at 25°C
- Low Offset Drift: 2.5 µV/°C
- Input Impedance: 10^9 || 3.9 pF
- Wide Supply Range: ± 5 V to ± 15 V
- High Output Current: 95 mA

APPLICATIONS

- Wideband Photodiode Amplifier
- High-Speed Transimpedance Gain Stage
- Test and Measurement Systems
- Current-DAC Output Buffer
- Active Filtering
- High-Speed Signal Integrator
- High-Impedance Buffer

Photodiode Circuit



DESCRIPTION

The THS4631 is a high-speed, FET-input operational amplifier designed for applications requiring wideband operation, high-input impedance, and high-power supply voltages. By providing a 210-MHz gain bandwidth product, ±15-V supply operation, and 100-pA input bias current, the THS4631 is capable of simultaneous wideband transimpedance gain and large output signal swing. The fast 1000 V/µs slew rate allows for fast settling times and good harmonic distortion at high frequencies. Low current and voltage noise allow amplification of extremely low-level input signals while still maintaining a large signal-to-noise ratio.

The characteristics of the THS4631 make it ideally suited for use as a wideband photodiode amplifier. Photodiode output current is a prime candidate for transimpedance amplification as shown below. Other potential applications include test and measurement systems requiring high-input impedance, ADC and DAC buffering, high-speed integration, and active filtering.

The THS4631 is offered in an 8-pin SOIC (D), and the 8-pin SOIC (DDA) and MSOP (DGN) with PowerPAD™ package.

Related FET Input Amplifier Products

DEVICE	V_S (V)	GBWP (MHz)	SLEW RATE (V/µS)	VOLTAGE NOISE (nV/$\sqrt{\text{Hz}}$)	MINIMUM GAIN
OPA656	±5	230	290	7	1
OPA657	±5	1600	700	4.8	7
OPA627	±15	16	55	4.5	1
THS4601	±15	180	100	5.4	1

TEXAS INSTRUMENTS

D–8 DDA–8 DGN–8

THS4631

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