

Photosensor amplifier



C9051

Small on-board type current-to-voltage conversion amp

The C9051 is a current-to-voltage conversion amplifier specifically designed for low-light-level measurement using a photodiode (sold separately).

Features

- Small on-board type for easy assembly
- Usable with photodiodes having large terminal capacitance
- Conversion impedance: 1.0×10^8 V/A
- Single +12 V supply voltage operation
- Small board size: 50 (W) × 50 (D) × 19 (H) mm

Applications

- Low-light-level detection
- Low-light-level optical power meters
- DC light monitors

Absolute maximum ratings (Ta=25 °C unless otherwise noted)

Parameter	Symbol	Value	Unit
Maximum voltage	Vcc max	+16	V
Operating temperature*1	Topr	0 to +50	°C
Storage temperature*1	Tstg	-10 to +60	°C

*1: No dew condensation

When there is a temperature difference between a product and the surrounding area in high humidity environment, dew condensation may occur on the product surface. Dew condensation on the product may cause deterioration in characteristics and reliability.

Note: Exceeding the absolute maximum ratings even momentarily may cause a drop in product quality. Always be sure to use the product within the absolute maximum ratings.

Electrical and optical characteristics (Ta=25 °C, Vcc=+12 V)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Conversion impedance	Tz		-	1 × 10 ⁸	-	V/A
Frequency bandwidth	fc	C9051 board, -3 dB	DC	-	16	Hz
Input photocurrent range	Isc	*2	0	-	40	nA
Maximum output amplitude	Vo	RL=1 kΩ	4.0	-	-	V
Output offset voltage	Vos	C9051 board	-5	-	5	mV
Equivalent noise input current	IN	Without photodiode, f=1 Hz	-	-	5 × 10 ⁻¹³	A/Hz ^{1/2}
Output noise voltage	enp-p	Without photodiode, full bandwidth	-	-	0.5	mVp-p
Output resistance	Ro		-	100	-	Ω
Maximum input capacitance	CIN		-	-	15	nF
Maximum capacitive load	CL		-	-	1000	pF
Current consumption	Icc	Without photodiode	-	-	20	mA
Supply voltage	Vcc	*3	+9	+12	+15	V
Power supply ripple voltage	VCC RIPPLE	*4	-	-	200	mVp-p

*2: When connecting a photodiode to the C9051, the cathode should be connected to the IN terminal of the C9051 and the anode grounded. Photocurrent input from the photodiode will be negative with respect to the amplifier.

*3: If not using the AC adapter that comes with the C9051, set the power supply voltage within this range. A separate adapter plug will be required for power input to the C9051.

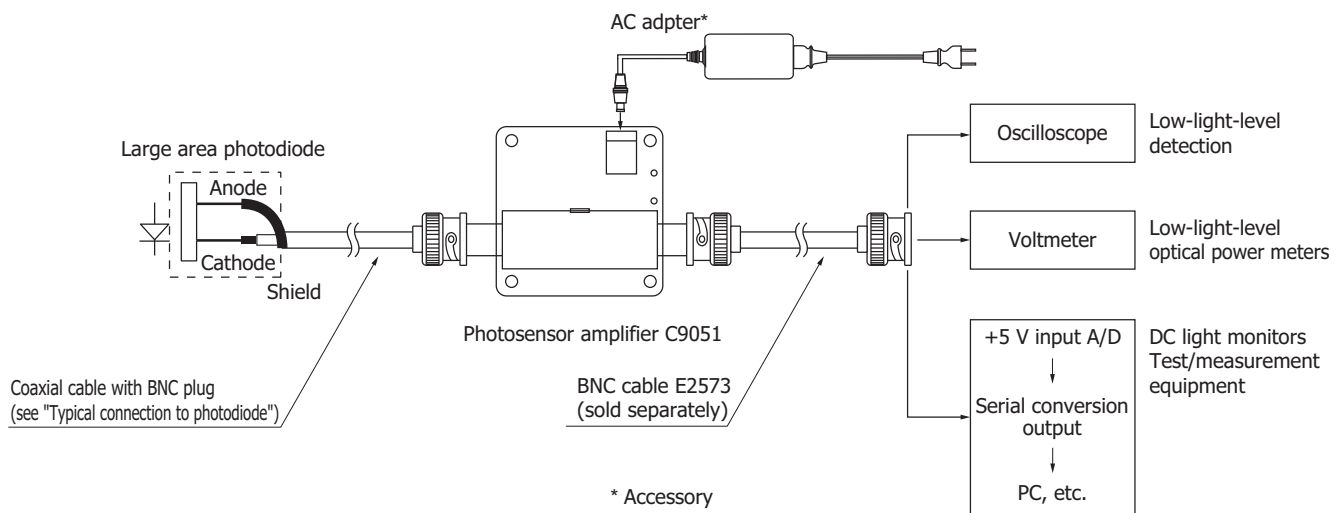
*4: This is the maximum ripple allowed for the power supply when operated with all loads listed on the power supply specification sheet, excluding switching noise that might appear superimposed on the ripple. When not using the AC adapter that comes with the C9051, always make sure the power supply output does not contain excessive ripple and noise.

Usable photodiodes

Any single-element photodiode with a terminal capacitance below 15 nF can be used. In photometric applications requiring high accuracy, we recommend using metal package or ceramic package photodiodes. For detailed information refer to datasheets for our photodiodes.

Note: The C9051 cannot be used with multi-element photodiodes, photodiodes with preamplifier, APD (avalanche photodiodes), photo IC diodes and reverse-biased photodiodes.

Connection example

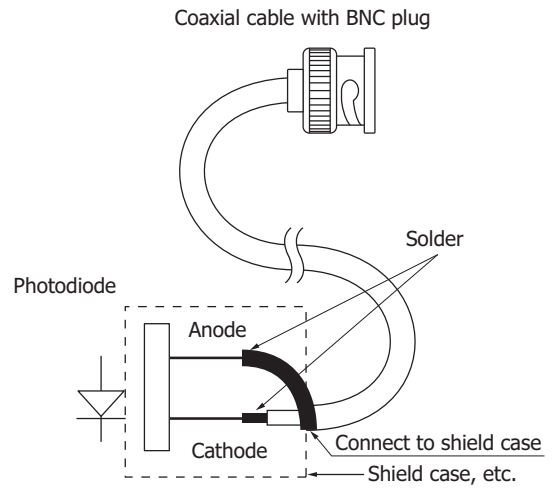


KACCC0179EB

Typical connection to photodiode

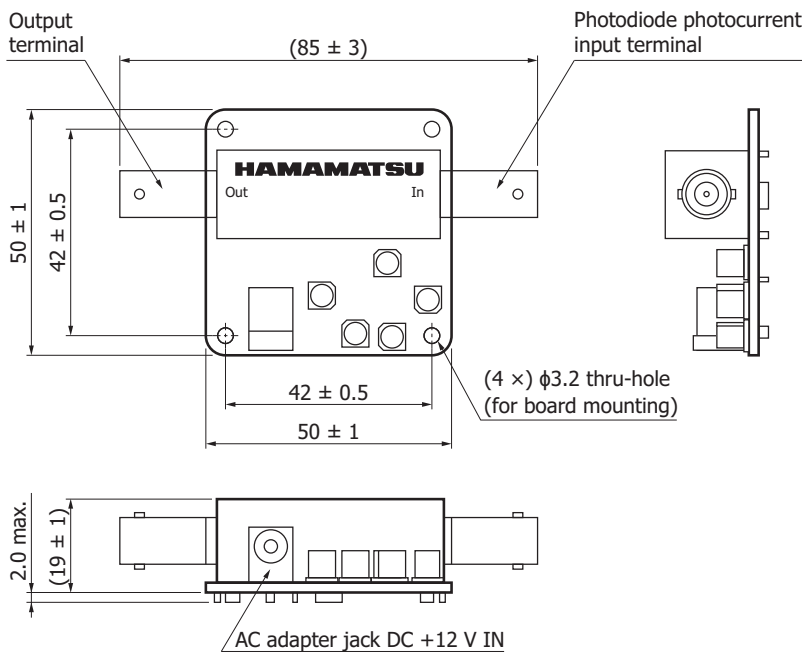
- To connect a photodiode to the C9051, use a coaxial cable terminated with a BNC plug. (Keep the capacitance including the cable capacitance and photodiode’s terminal capacitance from exceeding 15 nF.)
- Solder the photodiode leads to connect the tip of the cable wire. (See the drawing on the right.)
 Anode: Connect to the shield wire of the cable. (Make electrical connection with the shield.)
 Cathode: Connect to the core wire of the cable.
- To improve measurement accuracy, provide a shield around the photodiode. Do not use a cable any longer than necessary. (Keep the cable as short as possible.)

Note: When using a photodiode whose cathode is internally connected to its metal package, secure the photodiode with an insulating material when shielding. Otherwise, signal current cannot be drawn when the photodiode package is grounded.



KACCC0180EA

Dimensional outline (unit: mm)



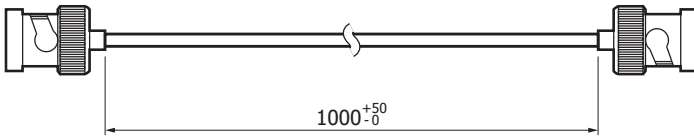
KACCC0116EA

Accessories

- Instruction manual
- AC adapter

Options (sold separately, unit: mm)

- BNC cable E2573
- Cable: 1.5D-QEV



KACCC0334EA

Related information

www.hamamatsu.com/sp/ssd/doc_en.html

Precautions

- Disclaimer

Information described in this material is current as of February 2018.

Product specifications are subject to change without prior notice due to improvements or other reasons. This document has been carefully prepared and the information contained is believed to be accurate. In rare cases, however, there may be inaccuracies such as text errors. Before using these products, always contact us for the delivery specification sheet to check the latest specifications.

The product warranty is valid for one year after delivery and is limited to product repair or replacement for defects discovered and reported to us within that one year period. However, even if within the warranty period we accept absolutely no liability for any loss caused by natural disasters or improper product use. Copying or reprinting the contents described in this material in whole or in part is prohibited without our prior permission.

HAMAMATSU

www.hamamatsu.com

HAMAMATSU PHOTONICS K.K., Solid State Division

1126-1 Ichino-cho, Higashi-ku, Hamamatsu City, 435-8558 Japan, Telephone: (81) 53-434-3311, Fax: (81) 53-434-5184

U.S.A.: Hamamatsu Corporation: 360 Foothill Road, Bridgewater, N.J. 08807, U.S.A., Telephone: (1) 908-231-0960, Fax: (1) 908-231-1218, E-mail: usa@hamamatsu.com

Germany: Hamamatsu Photonics Deutschland GmbH: Arzbergerstr. 10, D-82211 Herrsching am Ammersee, Germany, Telephone: (49) 8152-375-0, Fax: (49) 8152-265-8, E-mail: info@hamamatsu.de

France: Hamamatsu Photonics France S.A.R.L.: 19, Rue du Saule Trapu, Parc du Moulin de Massy, 91882 Massy Cedex, France, Telephone: 33-(1) 69 53 71 00, Fax: 33-(1) 69 53 71 10, E-mail: infos@hamamatsu.fr

United Kingdom: Hamamatsu Photonics UK Limited: 2 Howard Court, 10 Tewin Road, Welwyn Garden City, Hertfordshire AL7 1BW, United Kingdom, Telephone: (44) 1707-294888, Fax: (44) 1707-325777, E-mail: info@hamamatsu.co.uk

North Europe: Hamamatsu Photonics Norden AB: Torshamnsgatan 35 16440 Kista, Sweden, Telephone: (46)8-509 031 00, Fax: (46)8-509 031 01, E-mail: info@hamamatsu.se

Italy: Hamamatsu Photonics Italia S.r.l.: Strada della Moia, 1 int. 6, 20020 Arese (Milano), Italy, Telephone: (39)02-93 58 17 33, Fax: (39)02-93 58 17 41, E-mail: info@hamamatsu.it

China: Hamamatsu Photonics (China) Co., Ltd.: B1201, Jiaming Center, No.27 Dongsanhuan Beilu, Chaoyang District, Beijing 100020, China, Telephone: (86) 10-6586-6006, Fax: (86) 10-6586-2866, E-mail: hpc@hamamatsu.com.cn

Taiwan: Hamamatsu Photonics Taiwan Co., Ltd.: 8F-3, No. 158, Section2, Gongdao 5th Road, East District, Hsinchu, 300, Taiwan R.O.C. Telephone: (886)03-659-0080, Fax: (886)03-659-0081, E-mail: info@hamamatsu.com.tw