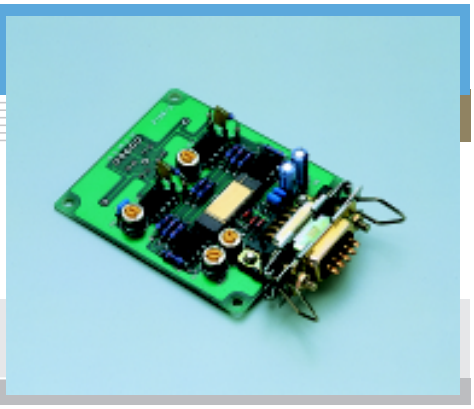
Signal processing circuit for 1-D PSD
C3683-01

Circuit board for easier 1-D PSD operation



Features

- No complicated adjustments required
  Position can be measured just by installing a 1-D PSD on the board.
- Accurate position sensing
  Position data of light spot is independent of light intensity.
- Compact design
  Head amp, signal addition/subtraction circuits, and analog divider circuit are mounted on a compact PC board.

Applications

- Displacement measurements using DC light
- Various studies using 1-D PSD
- Performance evaluation of 1-D PSD

■ Absolute maximum ratings

Parameter	Symbol	Value	Unit
Supply voltage	Vcc Max.	±18	V
Input signal current	IIN Max.	Vcc Max. × 10^{-5}	A
Output short-circuit time	-	Continuous	s
Operating temperature	Topr	0 to +50	°C

■ Recommended operating range

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Supply voltage	Vcc		±14.5	±15	±15.5	V

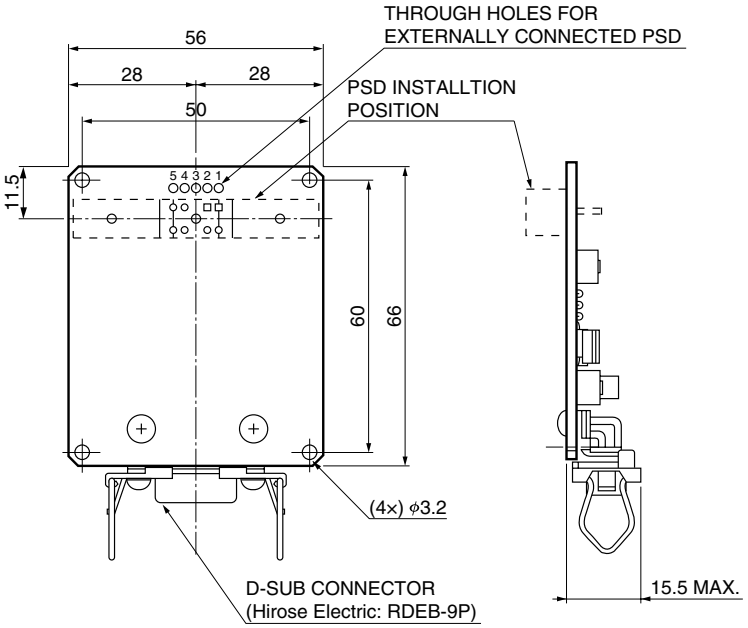
■ Specifications / Characteristics (Ta=25 °C, Vcc=±15 V)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Head amp conversion impedance *1	Rf	Factory setup prior to shipping	0.95 × 10^5	1 × 10^5	1.05 × 10^5	V/A
Feedback capacitance	Cf	Factory setup prior to shipping	950	1000	1050	pF
Input signal current *2	IIN	Photocurrent with PSD installed	1 × 10^{-5}	-	1 × 10^{-4}	A
Rise time (output 10 to 90 %)	tr	Output response time versus movement of light spot position, measured with PSD installed.	300	-	-	µs
PSD reverse voltage	VR	Factory setup prior to shipping	0	+5	+14	V
Output offset voltage	Vos	*3	-10	-	+10	mV
Output voltage amplitude	Vo	With PSD installed and light spot falling on edge of active area.	-10	-	+10	V
Output noise (analog divider)	Vn	All range *3	-	25	-	mVp-p
Current consumption	Icc	*3	-	±15	-	mA

*1: These resistors are lead types and inserted into sockets, so it can be easily to exchange by the user if necessary in a range between 1 × 10^4 to 1 × 10^6 Ω.
For more details, see the instruction manual that comes with the product.
*2: PSD does not operate correctly if the input signal current is outside the specified range.
*3: With no PSD installed, 20 µA (X1=X2) is supplied to the circuit as current signal that substitutes for PSD photocurrent

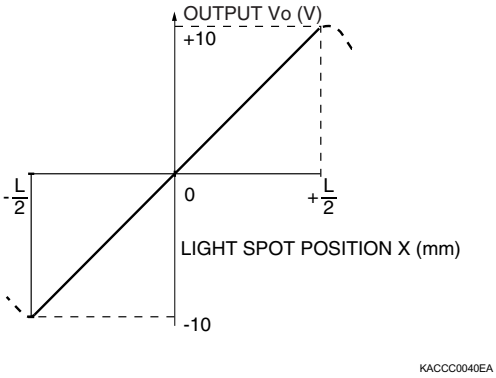
SOLID STATE DIVISION

■ Dimensional outline (unit: mm, tolerance: ±0.2 mm)

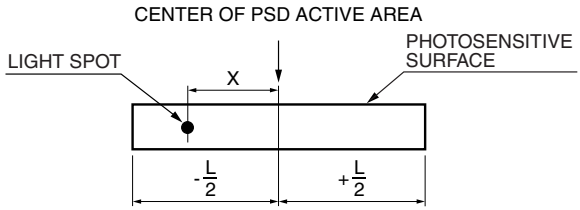


KACCA0035EC

■ PSD and output voltage



KACCC0040EA



KPSDC0062EA

S1352, S3931 and S3932 (PSD made by Hamamatsu) can be directly mounted on the board. To mount other types of 1-D PSDs, use through holes on the board.

■ Input/output terminals

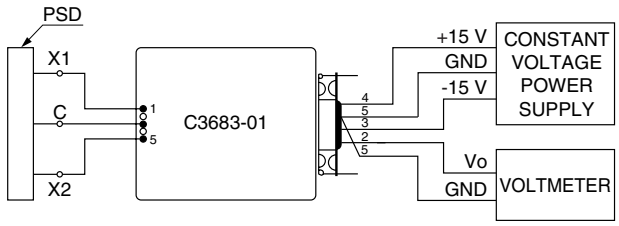
● D-sub connector

Terminal No.	Name	Content
1	V_R	PSD bias voltage monitor output
2	Vo	Divider output (position-converted voltage)
3	-V	-15 V input
4	+V	+15 V input
5	G	GND
6	V_B	Subtracted signal output
7	V_2	Head amp output 2
8	V_1	Head amp output 1
9	V_A	Summed signal output

● Through holes for externally connected PSD

Terminal No.	Name	Content
1	IN_1	Input from PSD output 1
2	G	GND
3	V_R	Bias voltage output for connection to PSD cathode
4	G	GND
5	IN_2	Input from PSD output 2

■ Operating example



KACCC0039EA

Measurement conditions
1. Light source: LED (λp=900 nm)
2. Light spot: φ200 μm
3. PSD: S1352 (L=34 mm)
4. PSD photocurrent: 10 μA
5. Voltmeter: 195A (KEITHLEY)
6. Frequency bandwidth: 10 Hz
7. Constant voltage power supply: ±15 V, power supply capacity: 0.1 A or more, ripple voltage: 3 mVp-p or less

When measured under the above conditions, the following output voltage amplitude and position resolution can be obtained.
· Output voltage amplitude: V_{FS}=±10 V
· Position resolution: Δl=approx. 0.3 μm (calculated value)

■ Accessories

· Connector HDEB-9S (Hirose Electric: For connections to power supply and output readout device)

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