

InGaAs multichannel detector head

C8061-01

C8062-01

Designed for InGaAs linear image sensor

The C8061/C8062-01 series are high sensitivity multichannel detector heads for use with InGaAs linear image sensors. The C8061-01 is designed for the one-stage TE-cooled InGaAs linear image sensors and the C8062-01 for two-stage TE-cooled InGaAs linear image sensors.

The C8061-01 and C8062-01 incorporate a low-noise driver/amplifier circuit that provide reliable operation from simple external signals. They also include a highly stable temperature controller that cools the sensor to a preset temperature level (C8061-01: Ts=-10 °C, C8062-01: Ts=-20 °C) as soon as the power is turned on. If the cooler fails and overheat occurs, the built-in protection circuit automatically turns off the power to maintain safety. Despite its compact size, the housing configuration is designed for good heat dissipation, and threaded mounting holes on the front panel allow connections to other devices such as monochromators.

Controller for multichannel detector head C7557-01 is also available. The software supplied with the C7557-01 allows easy control of the multichannel detector head and data acquisition.

Features

- Designed for InGaAs linear image sensor C8061-01: One-stage TE-cooled type C8062-01: Two-stage TE-cooled type
- Built-in driver/amplifier and temperature circuit
- Highly stable temperature controller
 Cooling temperature (Ta=10 to 30 °C)
 fixed at Td=-10 ± 0.1 °C (C8061-01), -20 ± 0.1 °C (C8062-01)
- ⇒ Simple signal input operation
- Compact configuration

Applications

- Near infrared multichannel spectroscopy
- Radiation thermometry
- Non-destructive inspection
- Optical fiber transmittance measurement

Selection Guide

The table below shows InGaAs image sensors applicable for the C8061/C8062-01. Scince the C8061/C8062-01 do not include a InGaAs image sensor, so select the desired sensor and order it sparately.

	InGaAs linear image sensor								
Type no.	Type no.	Cooling	Number of	Number of	Pixel size	Image size			
	туре по.	Cooling	pixels	effective pixels*1	$[\mu m (H) \times \mu m (V)]$	$[mm (H) \times mm (V)]$			
	G9201-256S		256	256	50 × 250	12.8 × 0.25			
	G9202-512S	One-stage TE-cooled	512	512	25 × 250	12.8 × 0.25			
	G9203-256S		256	256	50 × 500	12.8 × 0.50			
C8061-01	G9204-512S		512	512	25 × 500	12.8 × 0.50			
C0001-01	G9211-256S		256	>253	50 × 250	12.8 × 0.25			
	G9212-512S		512	>506	25 × 250	12.8 × 0.25			
	G9213-256S		256	>253	50 × 500	12.8 × 0.50			
	G9214-512S		512	>506	25 × 500	12.8 × 0.50			
	G9205-256W								
000/0.01	G9206-256W	Two-stage	256	>244	50 × 250	12.0 0.25			
C8062-01	G9207-256W	TE-cooled				12.8 × 0.25			
	G9208-256W								

^{*1:} Number of active pixels: The total number of pixels whose dark current and sensitivity uniformity do not exceed the maximum values.

■ Absolute maximum ratings

Parameter		Min.	Тур.	Max.	Unit	
Supply voltage (for digital circuitry)		-0.5	-	+7		
Supply voltage (for applied circuity)	VA+	-	-	+18		
Supply voltage (for analog circuitry)	VA-	-	-	-18	M	
Cumply voltage	Vp	-	-	+7	V	
Supply voltage	VF	-	-	+14		
Digital input voltage	-	-	-	VD1, VD2		
Operating temperature Storage temperature		+10 to +30			°C	
		0 to +50				

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 characteristics

[unless otherwise noted, Ta=25 °C,

C8061-01: $V_{D1},V_{D2}=+5$ V, $V_{A+}=+15$ V, $V_{A-}=-15$ V, $V_{D2}=+5$ V, $V_{p}=+5$ V, $V_{F}=+12$ V

C8062-01: VD1=+5 V, VA+=+15 V, VA-=-15 V, VD2=+6 V, Vp=+6 V, VF=+12 V]

Parameter			Symbol	Min.	Тур.	Max.	Unit
Digital input	High lev	High level		+2.0	-	VD1, VD2	V
Digital input Lo		Low level		-0.5	-	+0.8	V
Clock pulse frequency			fclk	-	-	4	MHz
Data video readout frequency			fv	-	-	fclk/8	Hz
Start pulse width			tst	1/fclk	-	-	S
Digital output	High lev	/el (lo=-6 mA)	Voн	+2.0	-	-	V
Digital output	Low lev	el (lo=+6 mA)	Vol	-	-	+0.8	V
Power supply conditions							
	Digital o	Digital circuitry		+4.75	+5.0	+5.25	V
	Analog	Analog circuitry		+14.5	+15.0	+15.5	V
	Arialog			-14.5	-15.0	-15.5	V
Voltago		C8061-01	V _{D2}	+4.75	+5.0	+5.25	V
Voltage		C8062-01		+5.75	+6.0	+6.25	V
	Other	C8061-01	Vp	+4.75	+5.0	+5.25	V
		C8062-01		+5.75	+6.0	+6.25	V
			VF	+11.75	+12.0	+12.25	V
	VD1 (+5	V _{D1} (+5 V)		-	-	+100	mA
	VA+ (+	VA+ (+15 V)		-	-	+200	mA
	VA- (-15	Va- (-15 V)		-	-	-50	mA
	VD2	VD2					
Current	C8061-0	C8061-01: +5 VDC		-	-	+50	mA
	C8062-0	C8062-01: +6 VDC					
	Vp -	C8061-01: +5 VDC	-	-	+1.2	+1.7	Α
		C8062-01: +6 VDC	-	-	+2.0	+3.0	Α
	VF (+12	VF (+12 V)		-	-	+200	mA



■ Electrical and optical characteristics

[Unless otherwise noted, Ta=25 °C,

C8061-01: Td=-10 °C, G9211-256S (Cf=10 pF) , VD1=+5 V, VA+=+15 V, VA-=-15 V, VD2=+5 V, VP=+5 V, VP=+12 V C8062-01: Td=-20 °C, G9208-256W (Cf=10 pF), VD1=+5 V, VA+=+15 V, VA-=-15 V, VD2=+6 V, VP=+6 V, VP=+12 V]

Parameter		Symbol	Min.	Тур.	Max.	Unit
Spectral response range	C8061-01	2	-	0.9 to 1.67	-	μm
Spectral response range	C8062-01	^	-	0.9 to 2.55	-	μm
Doak consitivity wavelength	C8061-01	l n	-	1.55	-	μm
Peak sensitivity wavelength	C8062-01	λр	-	2.3	-	μm
Saturation output charge		Qsat	-	30	-	рС
Conversion gain*2		G	-	0.3	-	V/pC
Dark current	C8061-01	In	-	0.1	3	pA/pixel
Dark current	C8062-01	ID	-	500	2000	pA/pixel
Photoresponse nonuniformity*3	C8061-01	DDMII	-	-	±5	%
Photoresponse nonuniformity	C8062-01	PRNU	-	-	±10	%

^{*2:} Including the circuit gain

Specifications for temperature controller

[Unless otherwise noted, Ta=25 °C,

C8061-01: Td=-10 °C, VD1=+5 V, VA+=+15 V, VA-=-15 V, VD2=+5 V, VP=+5 V, VF=+12 V C8062-01: Td=-20 °C, VD1=+5 V, VA+=+15 V, VA-=-15 V, VD2=+6 V, VP=+6 V, VP=+12 V]

Parameter	Symbol	Min.	Тур.	Max.	Unit	
Cooling tomporature	C8061-01	Td	-11	-10	-9	°C
Cooling temperature	C8062-01		-21	-20	-19	°C
Temperature control range	ΔTd	-0.1	-	+0.1	°C	
Power dissipation of peltier	r C8061-01 Pp		-	-	7	W
lement C8062-01		Pρ	-	-	11	W
Cool down time to preset temp	to	-	-	5	min	
Setting temperature for overheat protection*4		То	-	+45	-	°C

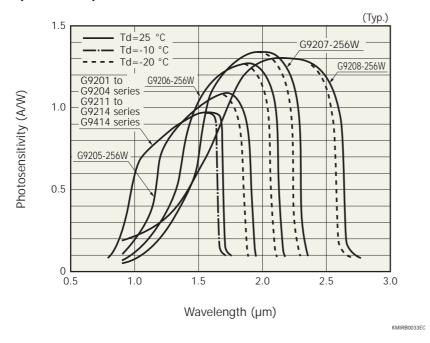
^{*4:} Temperature at back side of housing. (between housing and fin)

Note: Other functions include error display, automatic power off, and detection of electrical oepns and shorts by the thermosensor.

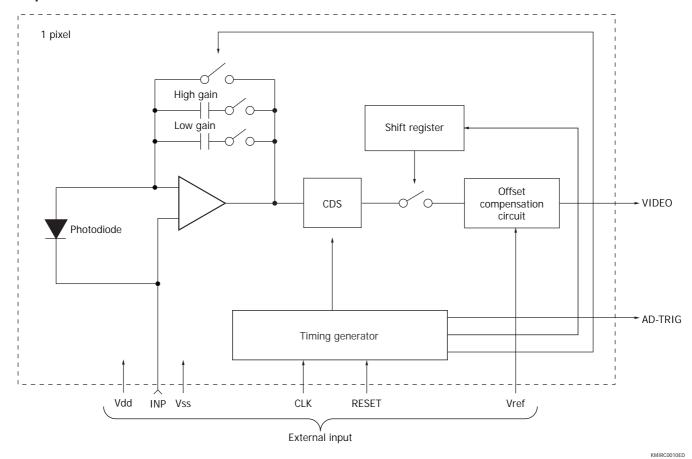


^{*3:} Measured at 50% of the saturated output charge. Except for the start pixel and the last pixel.

Spectral response

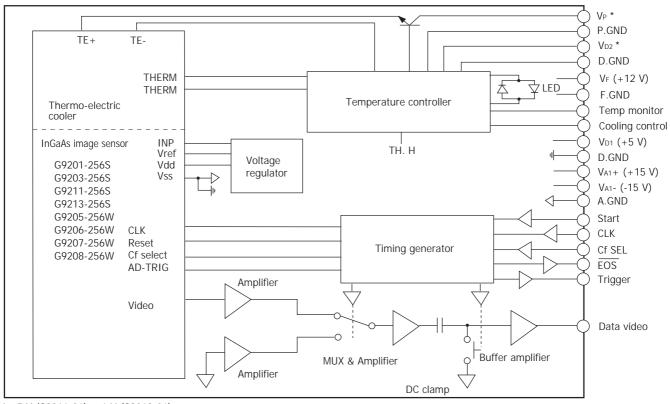


Equivalent circuit



MINITOGO TOLL

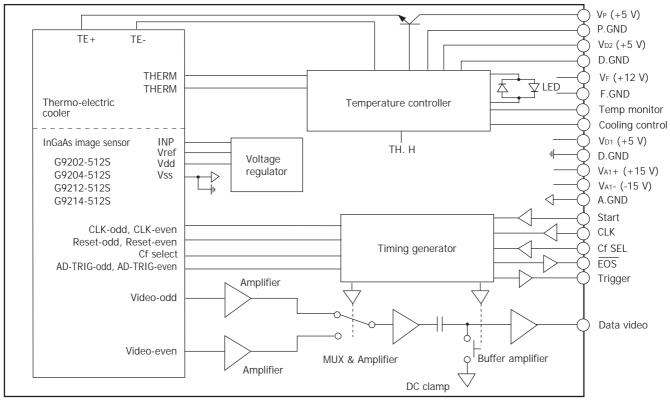
- Block diagram 1 (C8061/C8062-01)



* +5 V (C8061-01), +6 V (C8062-01)

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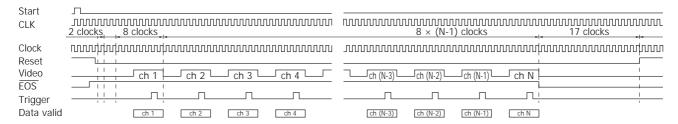
₽ Block diagram 2 (C8061-01)



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Timing chart 1 (256 pixels)

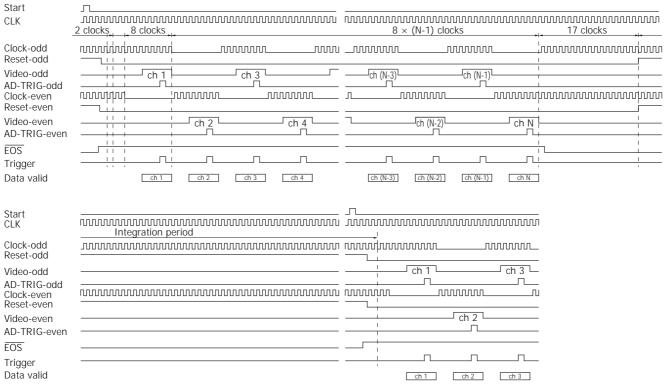




Note: N is the number of pixels (N=256)

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Timing chart 2 (512 pixels)

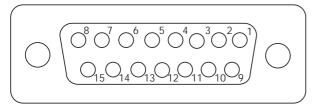


Note: N is the number of pixels (N=512)

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Pin assignment of "signal I/O" connector 15-pin D-sub connector

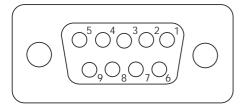


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Pin no.	Terminal name	Description
1	Cf SEL	Digital input signal used to select conversion gain of charge amplifier in InGaAs image sensor. HCMOS compatible High level or left open: Low gain (0.3 V/pC) Low level: High gain (6 V/pC)
2	Data video*5	Analog video output Positive polarity (Typ. 10 V)
3	VA1+ (+15 V)	Analog power supply
4	Va1- (-15 V)	Analog power supply
5	VD1 (+5 V)	Digital power supply
6	Start	Digital input signal for initializing the circuit HCMOS compatible. Positive logic
7	CLK	Digital input signal for operating the circuit HCMOS compatible Rising edge operation
8	EOS	Digital output signal for indicating end-of-scan of the image sensor HCMOS compatible Negative logic
9	A.GND	Analog ground
10	A.GND	Analog ground
11	NC	No Connection
12	D.GND	Digital ground
13	D.GND	Digital ground
14	D.GND	Digital ground
15	Trigger	Digital output signal for A/D conversion HCMOS compatible Positive logic

^{*5:} Depending on the individual sensor to install, some channels might have a dark output lower than ground potential so use a bipolar A/D converter.

Pin assignment of "TE-control" connector 9-pin D-sub connector



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Pin no.	Terminal name	Description		
1	VD2*6	Power supply		
2	Temp Monitor	Analog output signal of the temperature of the InGaAs image sensor		
		Digital input signal for starting to cool down		
3	Cooling control	HCMOS compatible.		
· ·	gooming control	H-level or left open: cooling		
		L-level : stand-by		
4	Vp*6	Power supply for the thermoelectric cooler in the InGaAs image sensor		
5	VF (+12 V)	Power supply for cooling fan		
6	D.GND	Ground		
7	D.GND	Ground		
8	P.GND	Power supply return of the thermoelectric cooler mounted in the InGaAs image sensor		
9	F.GND	Ground return for cooling fan		

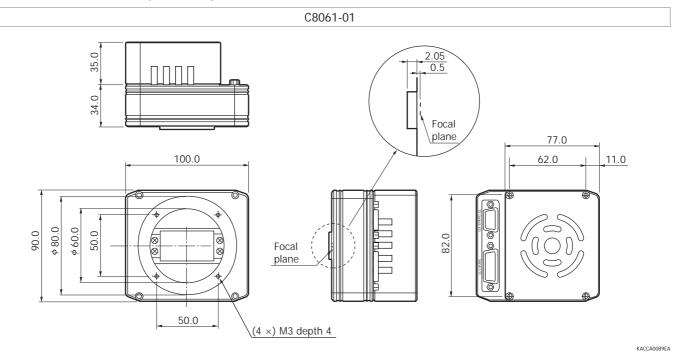
^{*6:} C8061-01: +5 V, C8062-01: +6 V

Note: Available for using same power supply (+6 V) for "VD2" and "VP".

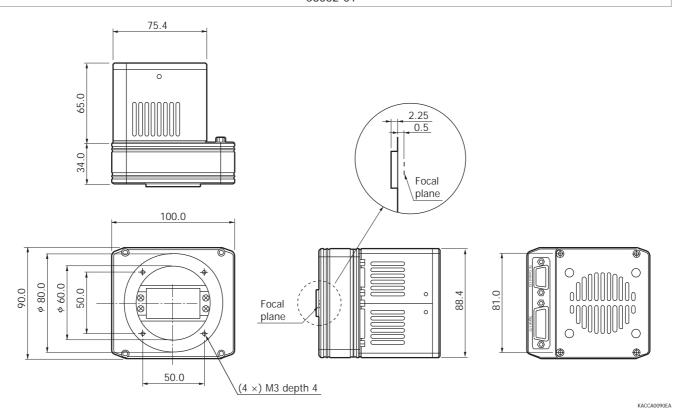
Caution: Do not connect "VD2" and "VP" together on the backside of the 9-sub D-sub connector.

These may be connected (shorted) at the power supply end, not 9-pin D-sub connector.

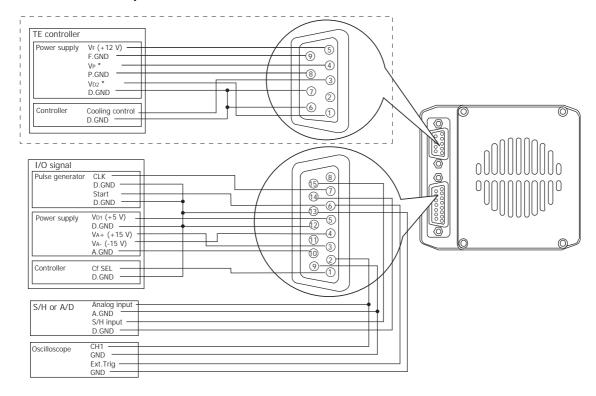
► Dimensional outline (unit: mm)



C8062-01



- Connection example



* C8061-01: +5 V, C8062-01: +6 V

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Multichannel detector head controller C7557-01

When connected to a HAMAMATSU multichannel detector head and a personal computer, the C7557-01 allows easy control of the detector head and data acquisition by using dedicated software that comes with the unit.

Suitable multichannel detector head

C7020/-02, C7021/-02, C7025/-02, C7040, C7041, C7043, C7044, C7180, C7181, C8061-01, C8062-01, C10150, C10151, C5964 series, C8892



Accessories

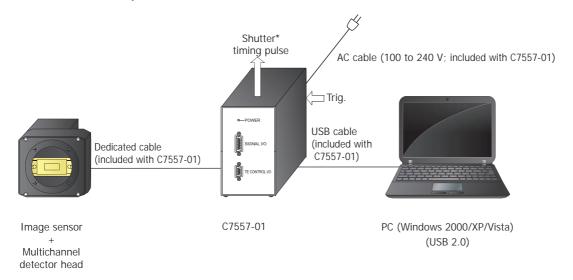
- · Spare fuse (2.5 A)*7
- · AC cable
- · 2 to 3 conversion adapter
- · USB cable
- Detector head connection cables (for "SIGNAL I/O" and "TE CONTROL I/O" terminal of multichannel detector head)
- · CD-R (MCD USB driver, software, operation manual)
- · MOS adapter*8
- *7: Contained in the holder just above the AC cable connector on the C7557-01 rear panel.
- *8: When operating the NMOS multichannel detector head, always be sure to attach the MOS adapter (supplied) to the C7557-01 main unit. If the the NMOS multichannel detector head is connected and the power is turned on without attaching the adapter, the power supply in the C7557-01 main unit may be damaged.

MOS adapter



MOS adapter mounting example

- Connection example



^{*} Shutter, etc. are not available.

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Information described in this material is current as of May, 2012.

Product specifications are subject to change without prior notice due to improvements or other reasons. Before assembly into final products, please contact us for the delivery specification sheet to check the latest information.

Type numbers of products listed in the delivery specification sheets or supplied as samples may have a suffix "(X)" which means preliminary specifications or a suffix "(Z)" which means developmental 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.

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