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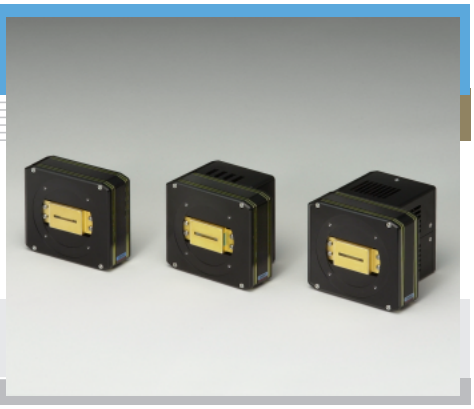
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NEW

IMAGE SENSOR



InGaAs multichannel detector head
C8060/C8061/C8062-01

Designed for InGaAs linear image sensor

C8060/C8061/C8062-01 series are high sensitivity multichannel detector heads for use with InGaAs linear image sensors. C8060-01 is designed for the non-cooled InGaAs linear image sensors, while C8061-01 and C8062-01 for the thermoelectrically cooled InGaAs linear image sensors for detection at even lower light levels.
C8060/C8061-01 and C8062-01 incorporate a low-noise driver/amplifier circuit that provide reliable operation from simple external signals. C8061-01 and C8062-01 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

Features

- Designed for InGaAs linear image sensor
  C8061/C8062-01: TE-cooled type
  C8060-01: non-cooled type
- Built-in driver/amplifier and temperature circuit
- Highly stable temperature controller (C8061/C8062-01)
  Cooling temperature (Ta=10 to 30 ˚C)
  fixed at -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/C8060/C8062-01.
Scince the C8061/C8060/C8062-01 do not include a InGaAs image sensor, so select the desired sensor and order it sparately.

Type No.	InGaAs linear image sensor					
	Type No.	Cooling	Number of pixels	Number of active pixels *1	Pixel size [μm(H) × μm(V)]	Active area [mm (H) × mm (V)]
C8060-01	G9201-256R	non-cooling	256	256	50 × 250	12.8 × 0.25
	G9202-512R		512	512	25 × 250	12.8 × 0.25
	G9203-256R		256	256	50 × 500	12.8 × 0.50
	G9204-512R		512	512	25 × 500	12.8 × 0.50
C8061-01	G9201-256S	One-stage TE-cooled	256	256	50 × 250	12.8 × 0.25
	G9202-512S		512	512	25 × 250	12.8 × 0.25
	G9203-256S		256	256	50 × 500	12.8 × 0.50
	G9204-512S		512	512	25 × 500	12.8 × 0.50
	G9211-256S		256	>251	50 × 250	12.8 × 0.25
	G9212-512S		512	>502	25 × 250	12.8 × 0.25
	G9213-256S		256	>251	50 × 500	12.8 × 0.50
	G9214-512S		512	>502	25 × 500	12.8 × 0.50
C8062-01	G9205-256W	Two-stage TE-cooled	256	>244	50 × 250	12.8 × 0.25
	G9206-256W					
	G9207-256W					
	G9208-256W					

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

PRELIMINARY DATA
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SOLID STATE DIVISION

■ Absolute maximum ratings

Parameter		Symbol	Min.	Typ.	Max.	Unit
Supply voltage (for digital circuitry)		V_{D1}, V_{D2} *2	-0.5	-	+7	V
Supply voltage (for analog circuitry)		V_{A+}	-	-	+18	
		V_{A-}	-	-	-18	
Supply voltage *2		Vp	-	-	+7	
		V_F	-	-	+14	
Digital input voltage	C8060-01	-	-	-	V_D	
	C8061/C8062-01		-	-	V_{D1}, V_{D2}	
Operating temperature	C8060-01	Topr	0 to +50			°C
	C8061/C8062-01		+10 to +30			
Storage temperature	C8060-01	Tstg	0 to +50			
	C8061/C8062-01		0 to +50			

■ Electrical Characteristics

[unless otherwise noted, Ta=25 °C,
C8060-01: V_D=+5 V, V_{A+}=+15 V, V_{A-}=-15 V,
C8061-01: $V_{D1,2}$=+5 V, V_{A+}=+15 V, V_{A-}=-15 V, V_{D2}=+5 V, Vp=+5 V, V_F=+12 V
C8062-01: V_{D1}=+5 V, V_{A+}=+15 V, V_{A-}=-15 V, V_{D2}=+6 V, Vp=+6 V, V_F=+12 V]

Parameter			Symbol	Min.	Typ.	Max.	Unit
Digital input	High level		V_{IH}	+2.0	-	$V_{D1, 2}$ *4	V
	Low level		V_{IL}	-0.5	-	+0.8	V
Master clock (CLK) pulse frequency			f_{CLK}	-	-	4	MHz
Data video readout frequency			fv	-	-	f_{CLK}/8	Hz
Master start (start) pulse width			tst	1/f_{CLK}	-	-	s
Digital output	High level (Io= -6 mA)		V_{OH}	+2.0	-	-	V
	Low level (Io=+6 mA)		V_{OL}	-	-	+0.8	V
Power supply conditions							
Voltage	Digital circuitry		V_{D1}	+4.75	+5.0	+5.25	V
	Analog circuitry		V_{A1+}	+14.5	+15.0	+15.5	V
			V_{A1-}	-14.5	-15.0	-15.5	V
	Other *3	C8061-01	V_{D2}	+4.75	+5.0	+5.25	V
		C8062-01		+5.75	+6.0	+6.25	V
		C8061-01	Vp	+4.75	+5.0	+5.25	V
		C8062-01		+5.75	+6.0	+6.25	V
			V_F	+11.75	+12.0	+12.75	V
Current	V_{D1} (+5 VDC)		-	-	-	+100	mA
	V_{A+} (+15 VDC)		-	-	-	+100	mA
	V_{A-} (-15 VDC)		-	-	-	-50	mA
	V_{D2} *3 C8061-01: +5 VDC C8062-01: +6 VDC		-	-	-	+20	mA
	Vp *3	C8061-01: +5 VDC	-	-	+1.2	+1.7	A
		C8062-01: +6 VDC	-	-	+2.0	+3.0	A
	V_F (+12 VDC) *3		-	-	-	+100	mA

*2: C8060-01 (V_{D1} only)
*3: C8061/C8062-01
*4: C8060-01: +V_D

■ Electrical and optical characteristics
[Unless otherwise noted, Ta=25 °C,
C8060-01: G9201-256R (Cf=10 pF), V_D=+5 V V_{A+}=+15 V, V_{A-}=-15 V
C8061-01: Ts=-10 °C, G9211-256S (Cf=10 pF) , V_{D1}=+5 V V_{A+}=+15 V, V_{A-}=-15 V, V_{D2}=+5 V, V_p=+5 V, V_F=+12 V
C8062-01: Ts=-20 °C, G9208-256W (Cf=10 pF), V_{D1}=+5 V, V_{A+}=+15 V, V_{A-}=-15 V, V_{D2}=+6 V, V_p=+6 V, V_F=+12 V]

Parameter		Symbol	Min.	Typ.	Max.	Unit
Spectral response range	C8060/C8061-01	λ	-	0.9 to 1.7	-	μm
	C8062-01		-	1.2 to 2.6	-	μm
Peak sensitivity wavelength	C8060/C8061-01	λp	-	1.55	-	μm
	C8062-01		-	2.3	-	μm
Saturation output charge		Qsat	-	30	-	pC
Conversion gain *5		G	-	0.3	-	V/pC
Dark current	C8060-01	I_D	-	2	8	pA/pixel
	C8061-01		-	0.1	3	pA/pixel
	C8062-01		-	1000	4000	pA/pixel
Photo response non-uniformity *6	C8060/C8061-01	PRNU	-	-	±5	%
	C8062-01		-	-	±10	%

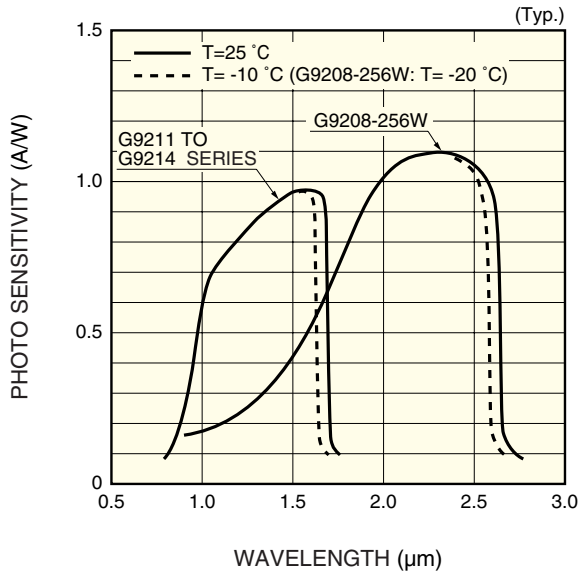
*5: Including the circuit gain.
*6: Measured at 50 % of the saturated output charge. Except for the start pixel and the last pixel.

■ Specifications for temperature controller (only for C8061/C8062-01)
[Unless otherwise noted, Ta=25 °C,
C8061-01: Ts=-10 °C, V_D=+5 V, V_{A+}=+15 V, V_{A-}=-15 V, V_{D2}=+5 V, V_p=+5 V, V_F=+12 V
C8062-01: Ts=-20 °C, V_D=+5 V, V_{A+}=+15 V, V_{A-}=-15 V, V_{D2}=+6 V, V_p=+6 V, V_F=+12 V]

Parameter *7		Symbol	Min.	Typ.	Max.	Unit
Cooling temperature	C8061-01	Ts	-11	-10	-9	°C
	C8062-01		-21	-20	-19	°C
Temperature control range		ΔTs	-0.1	-	+0.1	°C
Power dissipation of peltier element	C8061-01	Pp	-	-	7	W
	C8062-01		-	-	11	W
Cool down time to preset temperature		to	-	-	5	min.
Setting temperature for overheat protection *8		To	-	+45	-	°C

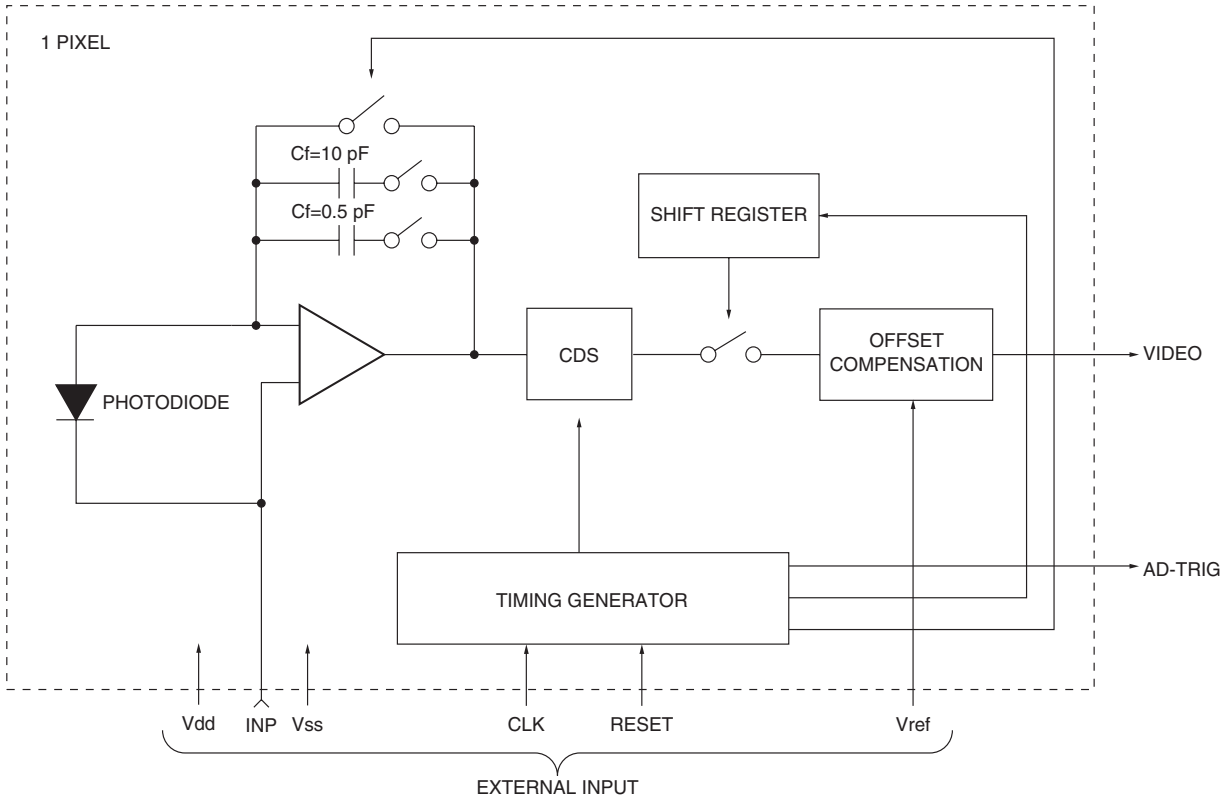
*7: Other functions include error display, automatic power off, and detection of electrical oepns and shorts by the thermosensor.
*8: Temperature at back side of housing. (between housing and fin)

■ Spectral response



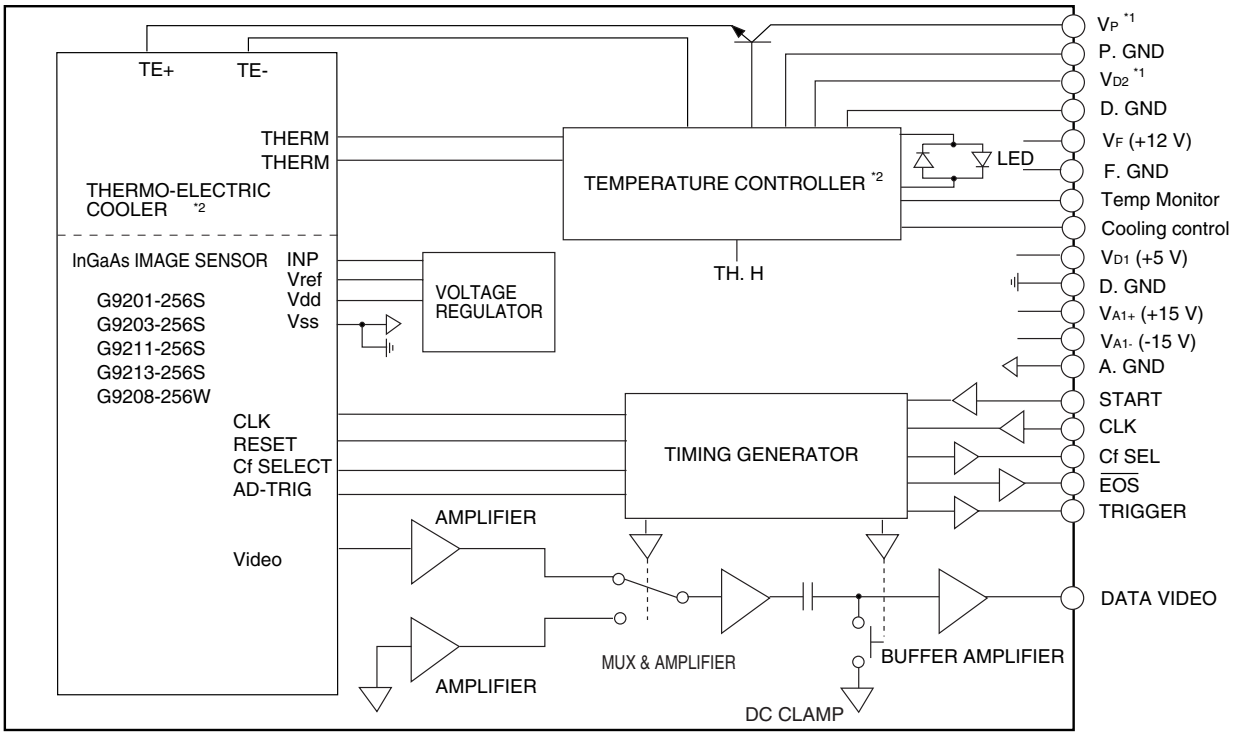
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■ Equivalent Circuit



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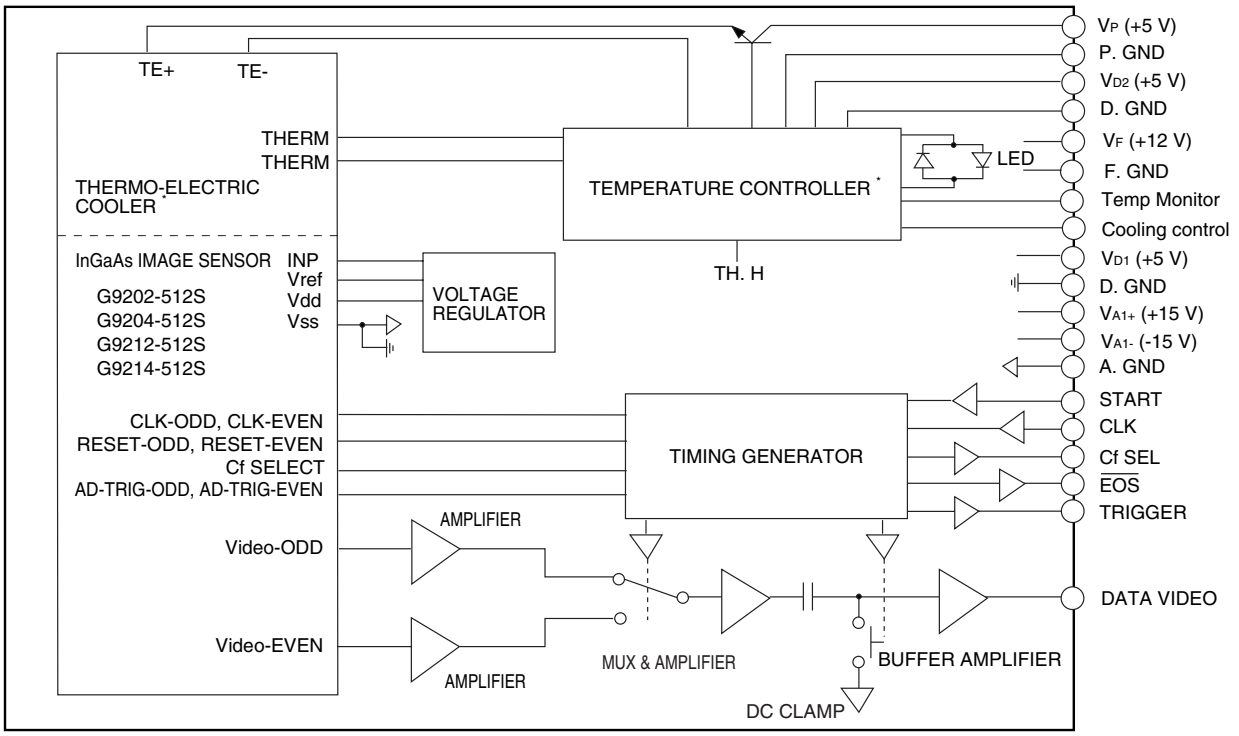
■ Block diagram 1 (C8060/C8061/C8062-01)



*1: +5 V (C8060/C8061-01), +6 V (C8062-01)
*2: C8060-01 does not include the temperature controller and thermoelectric cooler.

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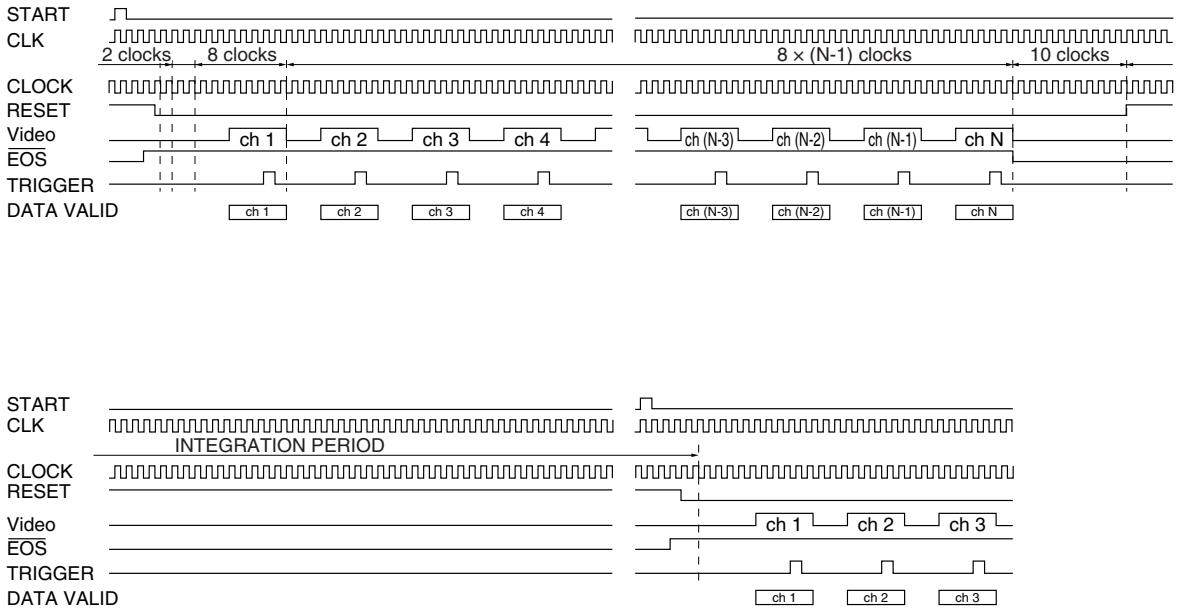
■ Block diagram 2 (C8060/C8061-01)



*C8060-01 does not include the temperature controller and thermoelectric cooler.

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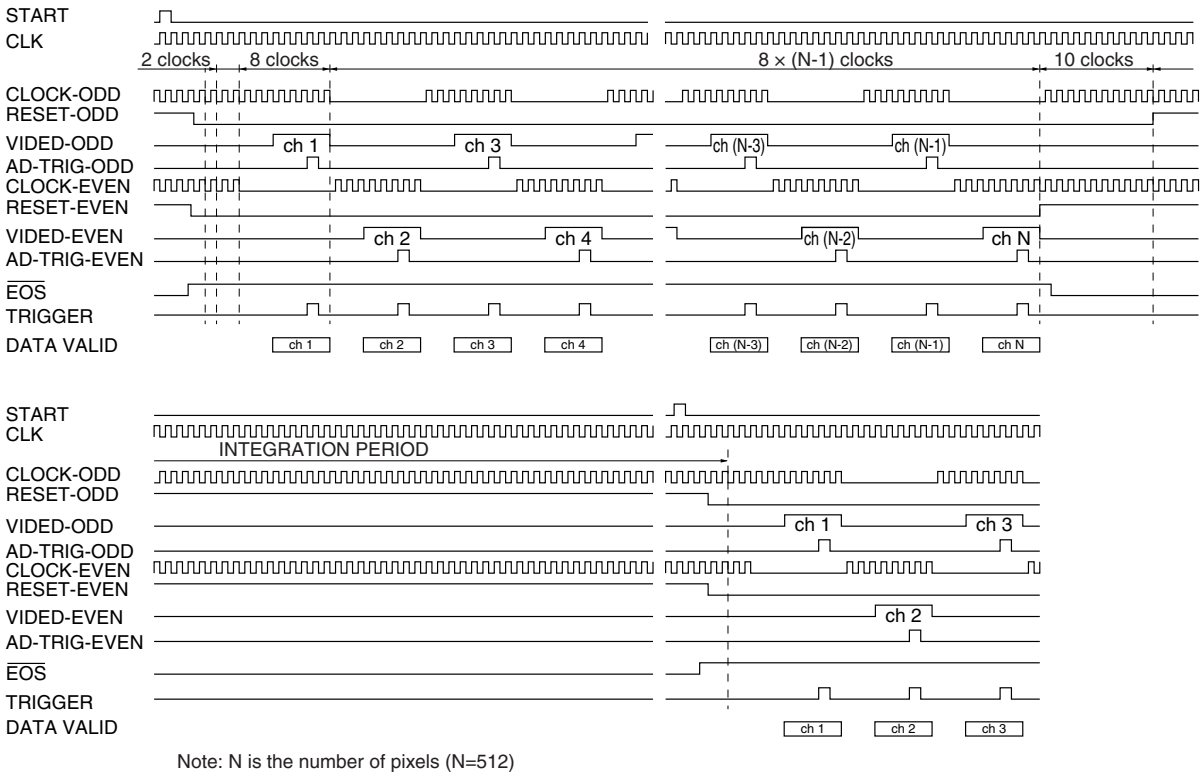
■ Timing chart 1 (256 pixels)



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

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■ Timing chart 2 (512 pixels)

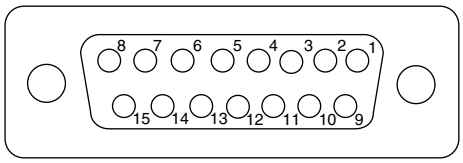


Note: N is the number of pixels (N=512)

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■ Pin assignment of “signal I/O” connector

15-pin D-sub connector

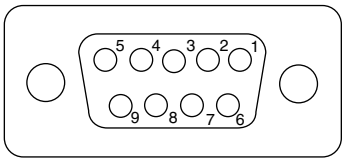


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Pin No.	Terminal name	Description
1	Cf SEL	Digital Input signal used to select conversion gain of charge amplifier in InGaAs image sensor. HCMOS compatible. High level or left open: Low gain (0.3 V/pc) Low level: High gain (6 V/pc)
2	Data video	Analog video output. Positive polarity
3	V_{A1+} (+15 V)	Analog power supply.
4	V_{A1-} (-15 V)	Analog power supply.
5	V_{D1} (+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	$\overline{\text{EOS}}$	Digital input 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.

■ Pin assignment of “TE control I/O” connector (C8061/C8062-01)

9-pin D-sub connector



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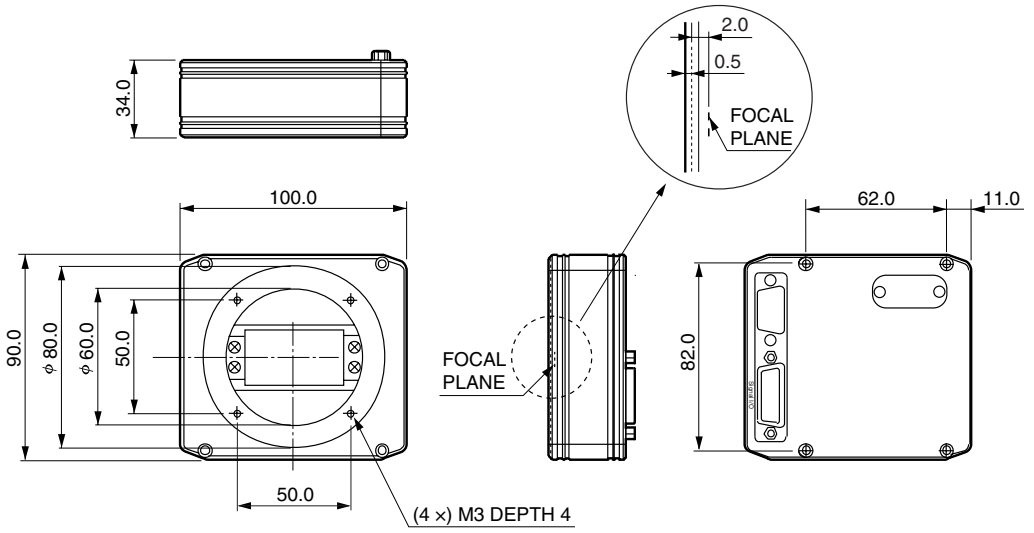
Pin No.	Terminal name	Description
1	V_{D2} (+6V)	Power supply.
2	Temp Monitor	Analog output signal of the temperature of the InGaAs image sensor.
3	Cooling control	Digital input signal for starting to cool down. HCMOS compatible. H-level or left open : cooling L-level : stand-by
4	Vp (+6V)	Power supply for the thermoelectric cooler in the InGaAs image sensor.
5	V_F (+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.

Note: Available for using same power supply (+6 V) for “V_{D2}” and “V_P”.

Caution: Do not connect “V_{D2}” and “V_P” 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.

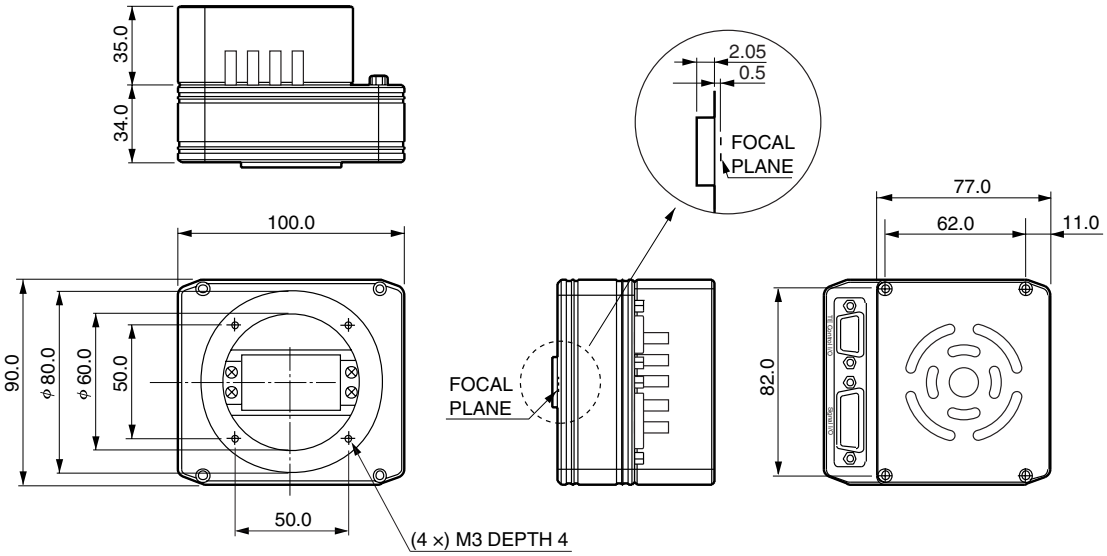
■ Dimensional outlines (unit: mm)

C8060-01



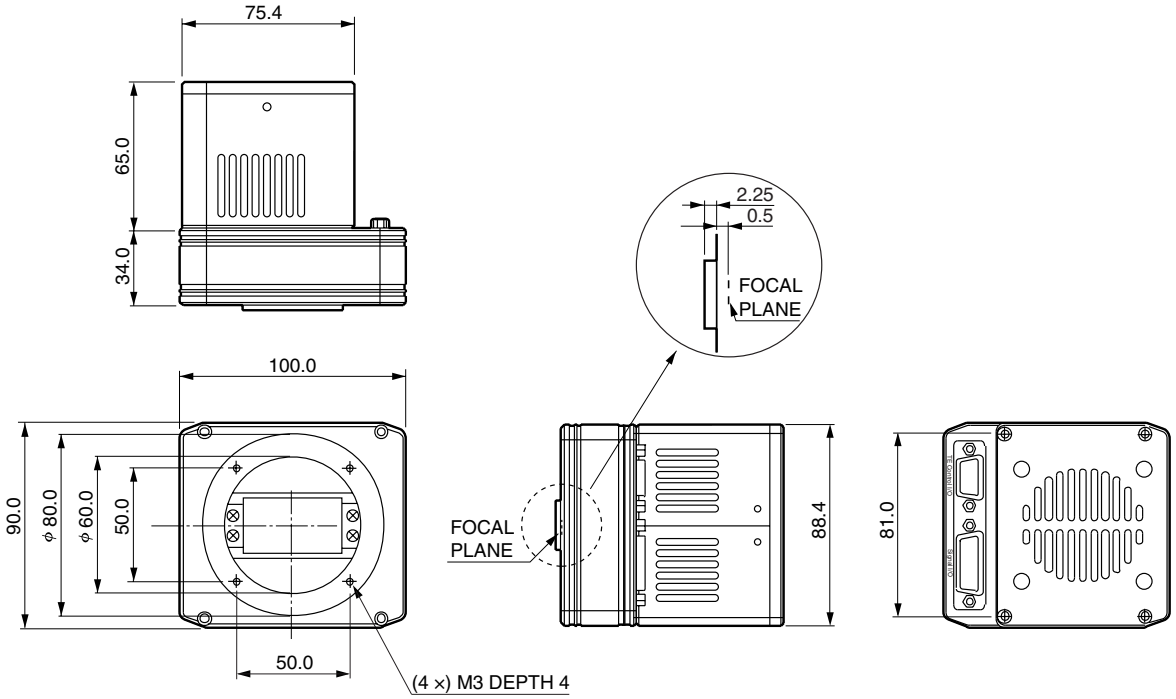
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C8061-01



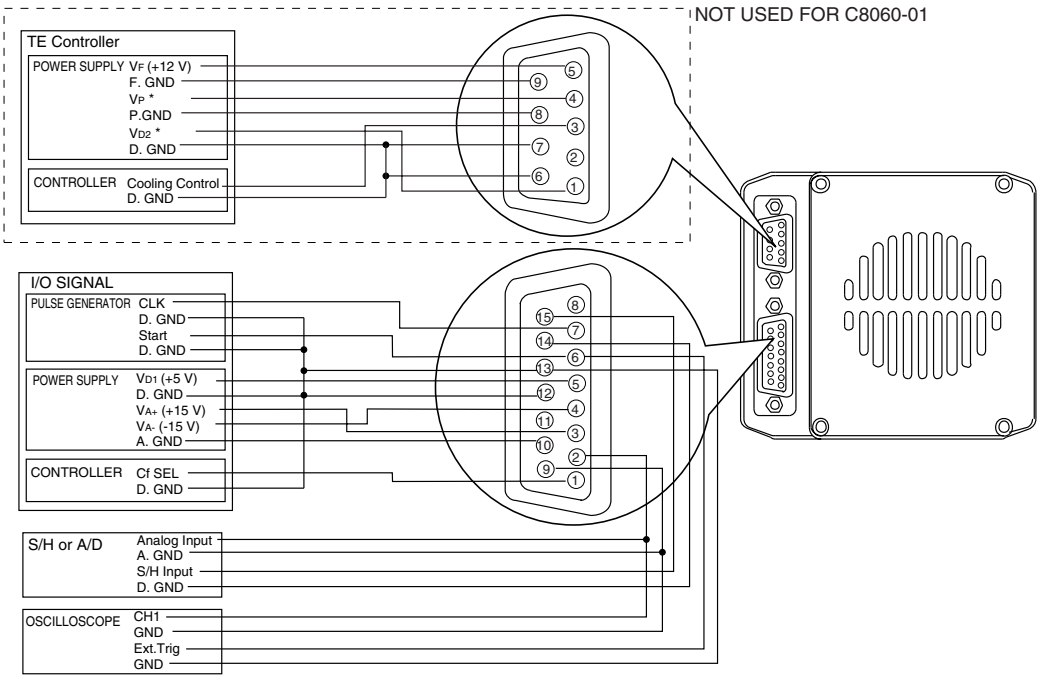
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C8062-01



KACCA0090EA

■ Connection Example



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

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