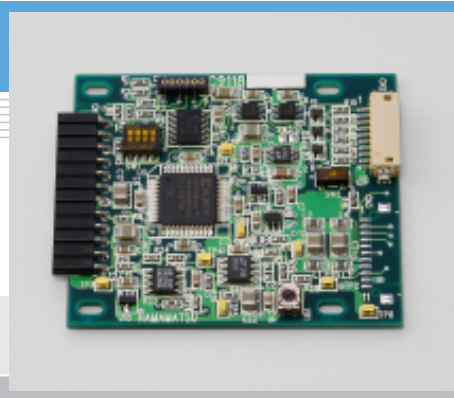


# Driver circuit for photodiode array with amplifier C9118 series

## Compact, easy-to-use driver circuit



C9118 series CMOS driver circuit is designed for S8865 series photodiode array with amplifier.

C9118 series operates a linear image sensor by just inputting two signals (M-CLK and M-RESET) and a signal +5 V supply. C9118 series is assembled on a compact board measuring 48 × 56 mm and allows downsizing of the measurement equipment.

C9118 is intended for single use or parallel connections, while C9118-01 is suitable for cascade connections.

C9118 series does not include S8865 series photodiode array with amplifier, so select the desired photodiode array and order it separately.

### Features

- Single power supply (+5 V) operation
- Operation with two input signals (M-CLK and M-RESET)
- Compact: 48 × 56 mm
- Assembled with low profile components

### Applications

- Various types of image acquisition
- Optical detection equipment

### ■ Absolute maximum ratings (Ta=25 °C)

Parameter	Symbol	Value	Unit
Supply voltage	Vcc	+7	V
Digital input voltage	-	V	V
Operating temperature	Topr	0 to 50 *1	°C
Storage temperature	Tstg	0 to 70 *1	°C

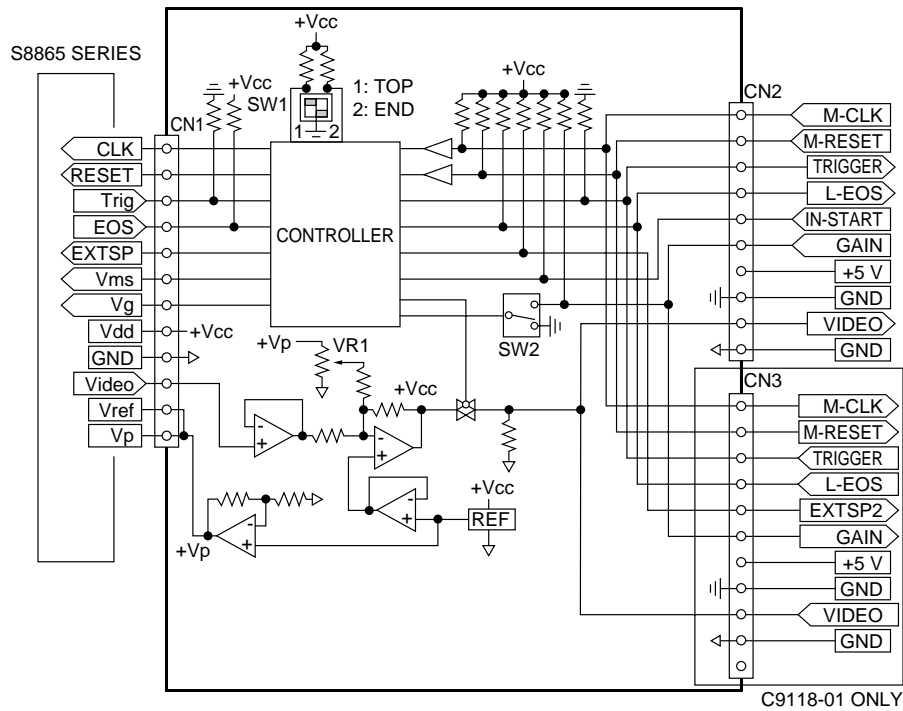
\*1: No condensation

### ■ Specifications (Ta=25 °C)

Parameter	Symbol	Min.	Typ.	Max.	Unit
Rated voltage	-	4.9	5.0	5.2	V
Current consumption	+Is	-	65	75	mA
Digital input	High level	V <sub>IH</sub>	2.0	-	V
	Low level	V <sub>IL</sub>	0	-	V
M-RESET pulse width (Low level)	TpwstRESET1	10	-	-	μs
M-CLK frequency	fCLK	40	-	4000	kHz
Digital rise/fall times	tTLH/ tTHL	-	20	30	ns
Data rate	fV	1	-	1000	kHz
Offset output	Voffset	-	0.5	-	V
VIDEO saturation output *2	Vast	-	4.0	-	V

\*2: From offset value.

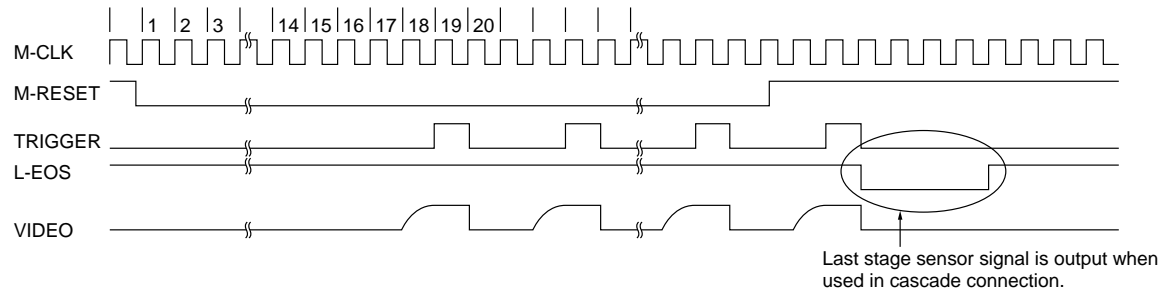
## ■ Block diagram



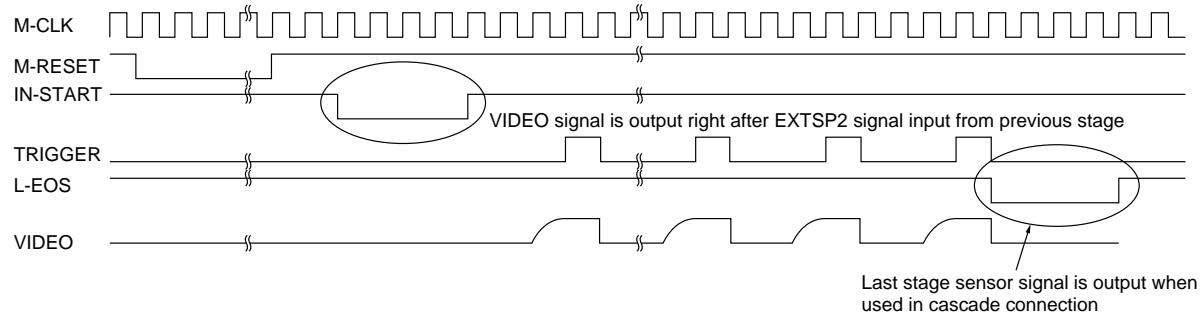
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## ■ Timing chart

Timing chart of first stage sensor when used singly or in cascade connection



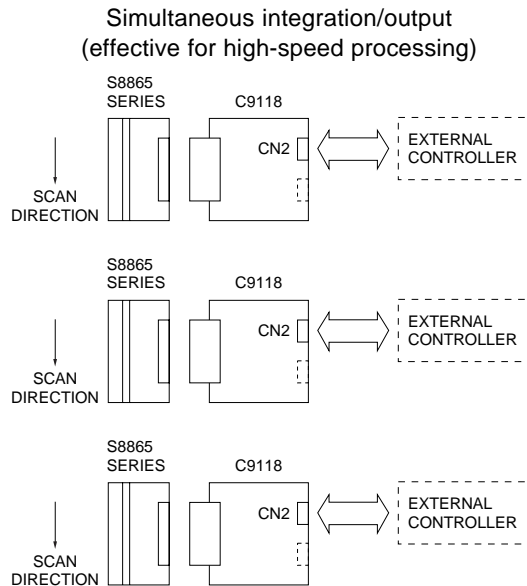
Timing chart of second and subsequent stage sensors when used in cascade connection



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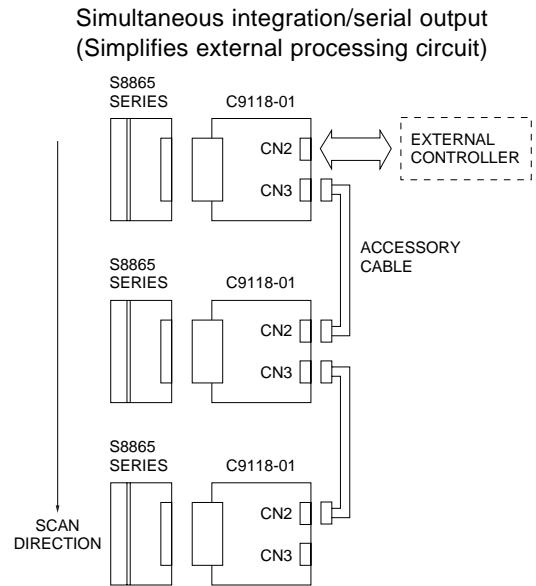
## ■ Connection examples

### Single or parallel readout example (C9118)



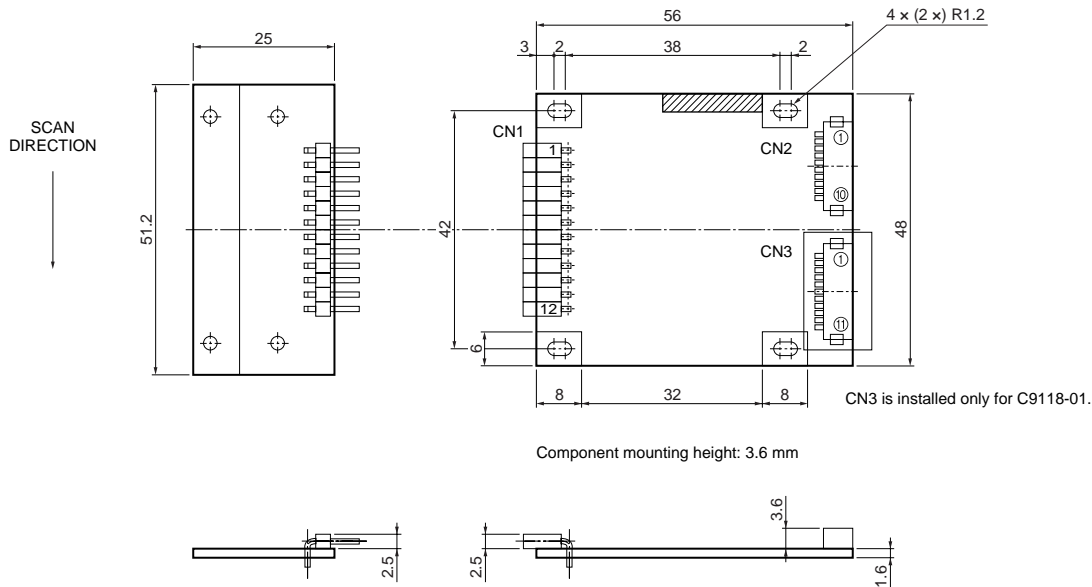
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### Cascade readout example (C9118-01)



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## ■ Dimensional outline (unit: mm)



## ■ Accessory

### · Connectorized cable

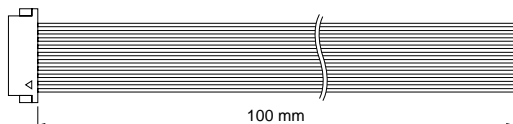
This cable is for hooking up an external unit (power supply, pulse generator, etc.) to the CN2 connector of C9118 driver circuit.

Pin No. and cable color coding are shown in the table at the right.

Connector: DF-13-10S-1.25C (Hirose Electric)

Terminal: DF13-2630SCFA (gold plating)

Cable: Conforms to UL1007 AWG28.



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### Pin connection (CN2)

Pin No.	Color	Pin No.	Color
①	Brown	⑥	Blue
②	Red	⑦	Purple
③	Orange	⑧	Gray
④	Yellow	⑨	White
⑤	Green	⑩	Black

■ Pin assignment of I/O connector

<CN1>

For connection to S8865 photodiode array

Connector type: 801-93-012-20-001 PRECI-DIP (made by DURTAL) or equivalent

Pin No.	Terminal Name	I/O	Description
1	RESET	O	Sensor scan start signal. Pulse width at High level nearly equals sensor integration time.
2	CLK	O	Sensor scan sync signal. Sensor starts scanning in synchronization with this signal.
3	Trig	I	For A/D conversion timing signals. Positive logic
4	EXTST	O	High level at first stage during parallel or serial readout. At second and subsequent stages during serial readout, this outputs the EOS pulse of preceding stage.
5	Vms	O	High level at first stage during parallel or serial readout. At second and subsequent stages, this sets to Low level.
6	Vdd	O	Sensor supply voltage
7	GND	-	Sensor GND
8	EOS	I	EOS (end of scan) signal of sensor. Negative logic
9	Video	I	Video output signal. Positive polarity
10	Vref	O	Reference voltage
11	Vgain	O	Sensor gain switching H: high gain, L: low gain
12	Vpd	O	Photodiode voltage

<CN2>

Used to connect the first stage to an external I/O during parallel readout or serial readout

For the second and subsequent stages during serial readout, CN2 is used to connect to CN3 at preceding stage.

Note 1) CN3 is installed only for C9118-01 (for serial readout).

Connector type: DF13-10P-1.25H (50) (made by Hirose Electric)

Pin No.	Terminal Name	I/O	Description
1	M-RESET	I	Sensor scan start signal. Pulse width at High level nearly equals sensor integration time.
2	M-CLK	I	Sensor scan sync signal. Sensor and circuit start operating in synchronization with this signal.
3	TRIGGER	O	For A/D conversion timing signals. Positive logic
4	L-EOS	O	EOS (end of scan) signal of all sensors during parallel or serial readout. Negative logic
5	IN-START	I	NC (no connection) at first stage during parallel or serial readout. At second and subsequent stages during serial readout, this receives the EOS pulse of preceding stage.
6	GAIN	I	External setting for sensor gain H: high gain, L: low gain
7	GND	-	Circuit GND
8	+5 V	I	+5 V power supply
9	VIDEO	O	Video output signal. Positive polarity
10	A.GND	O	Video GND

## <CN3>

Used to connect to CN2 at next stage during serial readout. (CN3 is installed only for C9118-01.)

Note 2) CN3 is installed only for serial readout.

Note 3) Pin No. 1 to 4 and 6 to 10 connect to the same pin No. of CN2 as common lines.

Connector type: DF13-11P-1.25H (50) (made by Hirose Electric)

Pin No.	Terminal Name	I/O	Description
1	M-RESET	I	Sensor scan start signal. Pulse width at High level nearly equals sensor integration time.
2	M-CLK	I	Sensor scan sync signal. Sensor starts scanning in synchronization with this signal.
3	TRIGGER	O	For A/D conversion timing signals. Positive logic
4	L-EOS	O	EOS (end of scan) signal of all sensors during parallel or serial readout. Negative logic
5	EXTSP2	O	Video signal scan start signal at second stage during serial readout. Negative logic
6	GAIN	I	External setting for sensor gain H: high gain, L: low gain
7	GND	-	Circuit GND
8	+5 V	I	+5 V power supply
9	VIDEO	O	Video output signal. Positive polarity
10	A.GND	O	Video GND
11	NC	-	No connection

## ■ Parallel readout and serial readout settings

### <Parallel readout setting>



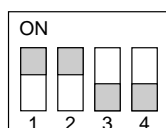
Set SW1 and SW2 to OFF as shown at left.  
(SW3 and SW4 have no connection)

### <First stage setting for serial readout>



Set SW1 to OFF and SW2 to ON as shown at left.  
(SW3 and SW4 have no connection)

### <Second stage to second from last stage setting for serial readout>



Set SW1 and SW2 to ON as shown at left.  
(SW3 and SW4 have no connection)

### <Last stage setting for serial readout>



Set SW1 to ON and SW2 to OFF as shown at left.  
(SW3 and SW4 have no connection)

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