DRIVER/AMPLIFIER CIRCUIT C4070

For Serial/Current Output Type MOS Linear Image Sensors

The C4070 is a low-noise driver/amplifier circuit designed specifically for use with Hamamatsu serial/current output type MOS linear image sensors (S3901, S3904, S3902, S3903). The C4070 driver/amplifier circuit includes a generator for a start pulse and two-phase clock pulses used to drive a MOS linear image sensor and the charge amplifier used to read out the video signal in the integration mode. The signal inputs required are only a master start pulse, a master clock pulse, +5V and ±15V.

In addition, the C4091 pulse generator is available, which supplies the C4070 with a master start pulse and a master clock pulse.

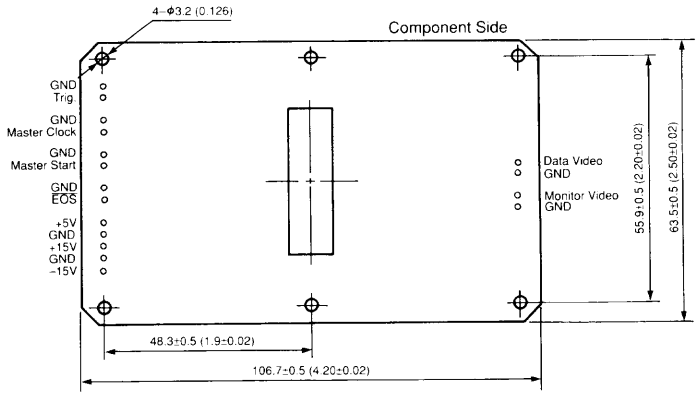
FEATURES

- **Structure allows easy cooling and optical alignment of MOS image sensor**
- **Simple operation: only a master start pulse, a master clock pulse, +5V and ±15V required**
- **Low noise**
- **Wide dynamic range**
- **Simple adjustment**

DESCRIPTIONS OF TERMINALS

	Terminals	Symbols	Descriptions
Input	Supply Voltage	V_d (+5) V_a (+15) (−15)	+5 Vdc, 70 mA +15 Vdc, 30 mA −15 Vdc, 30 mA
Input	Master Start ϕms	St.	CMOS logic compatible. Positive logic. For initializing the circuit and the MOS shift register.
Input	Master Clock ϕmc	CLK	CMOS logic compatible. The maximum frequency is 375 kHz. For synchronizing the circuit and the MOS shift register.
Output	Monitor Video	M.V.	Positive output. This is the integrated video signal from the MOS image sensor, and it is used for monitoring when cancelling the switching noises. Obtained synchronized with ϕ2.
Output	Data Video	D.V.	Positive output. This is the integrated, low-noise video signal of the MOS image sensor.
Output	Sample-and-hold	Trig.	CMOS logic compatible. Positive logic. This output can be used as the trigger signal for the sample-and-hold or A/D conversion.
Output	End of Scan	$\overline{EOS}$	CMOS logic compatible. Negative logic. This is the end-of-scan signal of the MOS shift register and it is obtained synchronized with ϕ2 right after the last element is scanned.

Figure 1: Dimensional Outline and Terminals



Dimensions in mm (inches)

Figure 2: Wiring Example

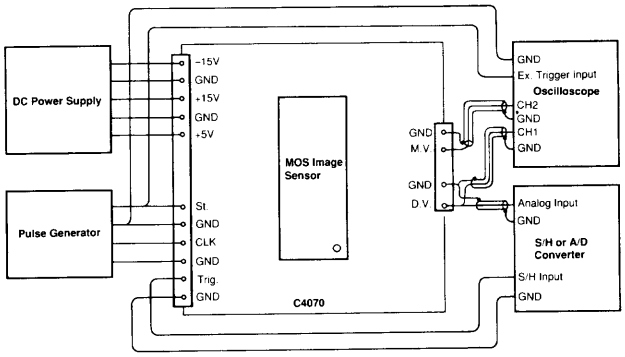
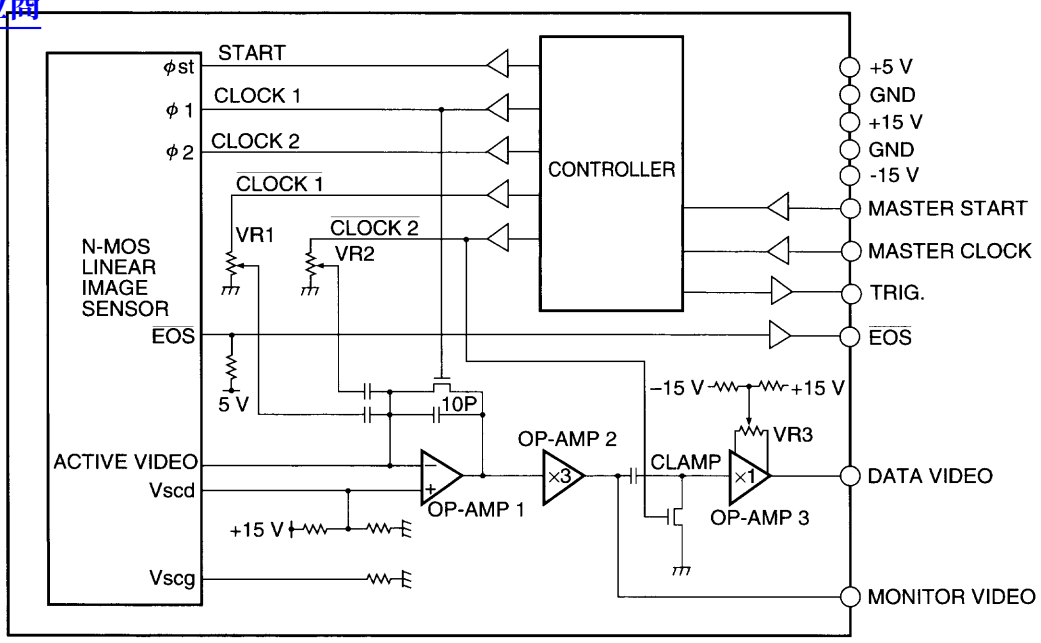


Figure 3: Block Diagram



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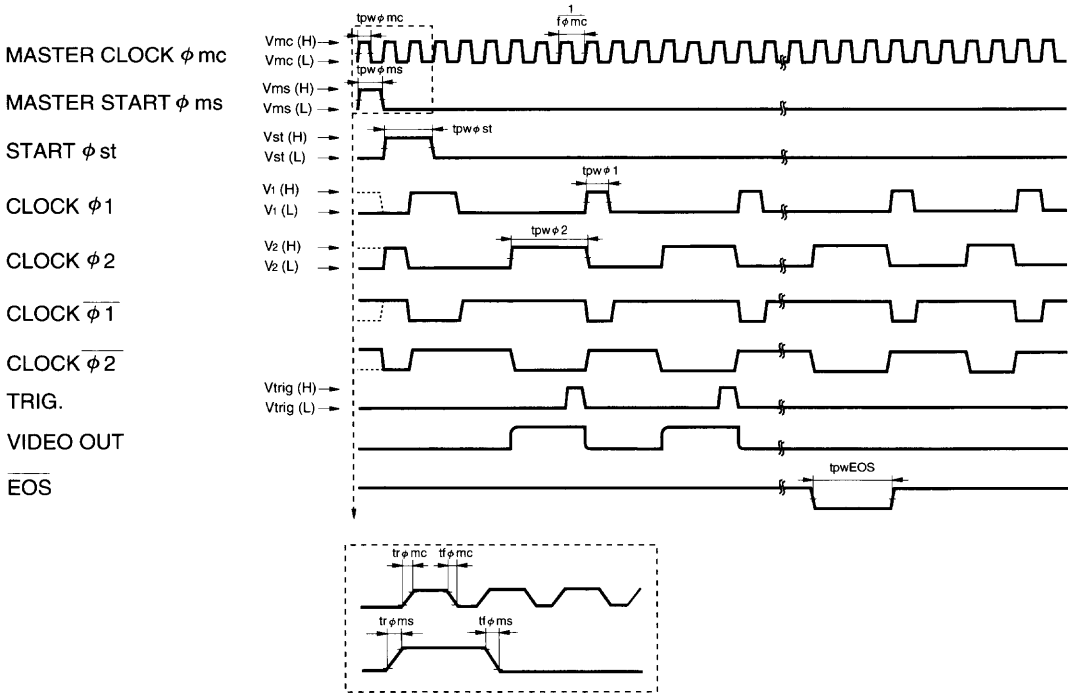
Caution)

The relation between the output charge from the MOS image sensor and the output voltage of the data video in the C4070 is represented by next equation.

$$V_{out}\ (\text{DATA VIDEO})\ (V) = 3 \times \frac{\text{OUTPUT CHARGE}\ (C)}{10 \times 10^{-12}\ (F)}$$

Figure 4: Timing Diagram



If an EOS pulse is output, the trigger output stops and the frequency of φ1 and φ2 changes from 6 times to 5 times the master clock.

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