

Realization of High-definition Videos and High-resolution Still Images

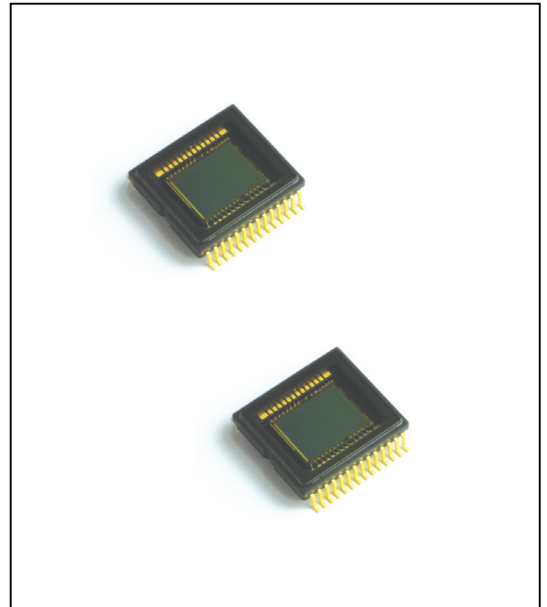
CCD Area Image Sensor MN39850PM

■ Overview

MN39850PM is a 1/1.8" optical format 10 Megapixel CCD image sensor, most suitable for high-resolution digital still cameras. Excellent color reproducibility was realized by applying an introduction of the RGB Bayer pattern primary color on-chip filter. And 30 frames/sec high-definition video shooting is possible through pixel mixture reading mode. Moreover, vivid and stable images are obtained through total 10,369,212 pixels (horizontal 3,738 x vertical 2,774).

■ Feature

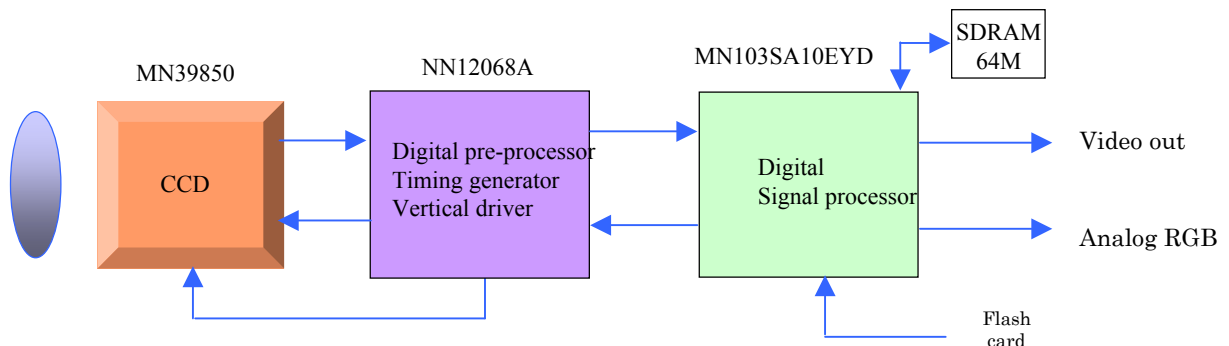
- Effective pixels 3,672(horizontal) × 2,760(vertical)
- High sensitivity
- 2.0μm × 2.0μm square pixels
- VGA 30 frames/s operation through pixel mixture reading mode
- Realization of wide dynamic range and high S/N ratio by reducing dark signal.
- Horizontal CCD 3.3V and low power consumption
- 28-pin plastic package



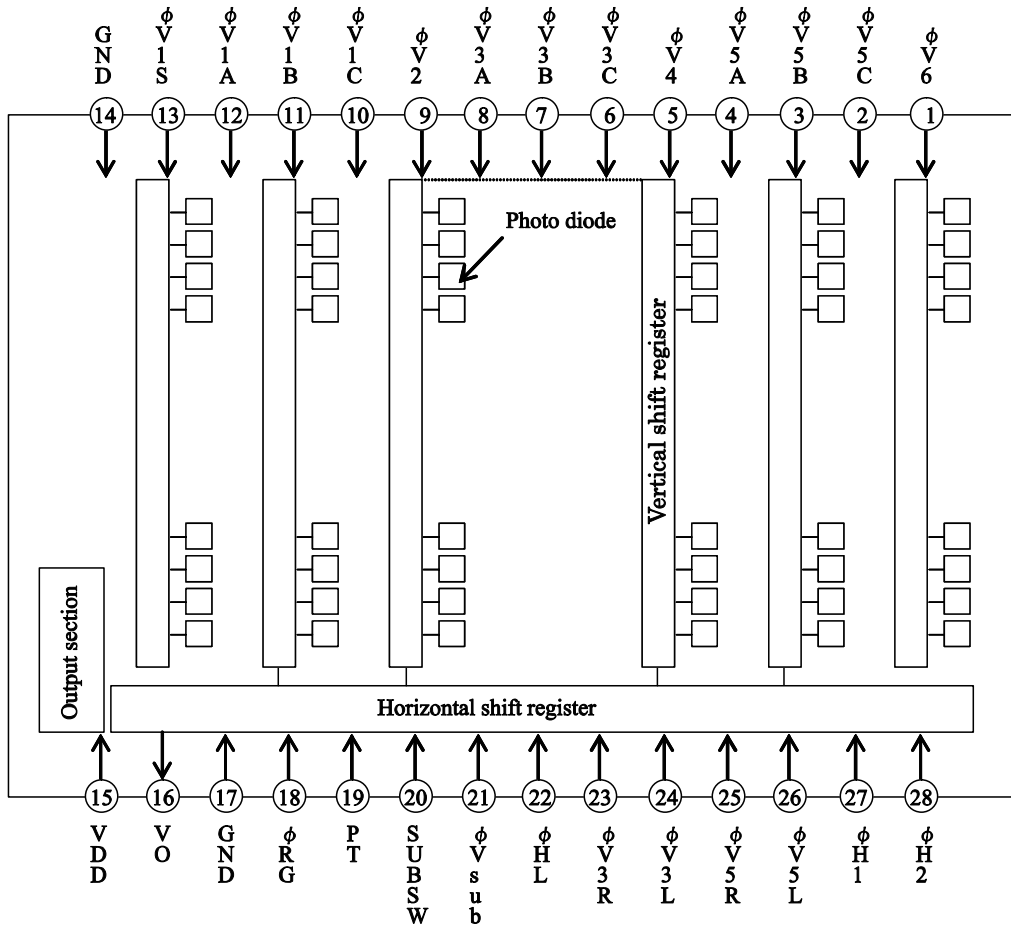
■ Applications

Digital still cameras

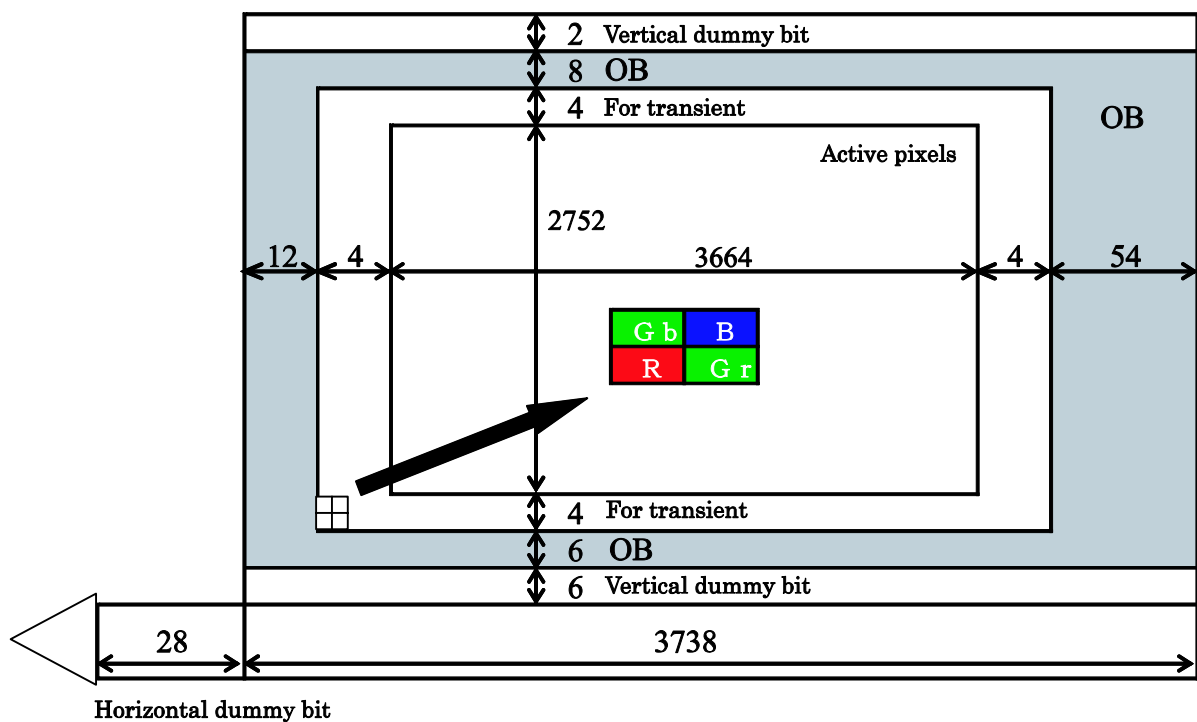
■ System Block Diagram



■ Block Diagram



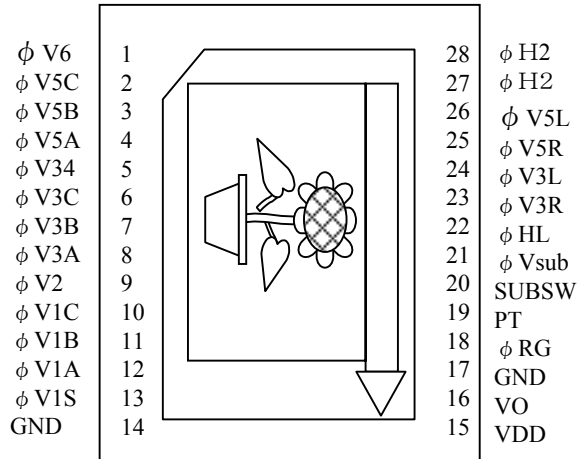
■ Element Construction



■ Pin Description

| Pin No. | Symbol | Pin Description | Pin No. | Symbol | Pin Description |
|---------|------------|--|---------|----------------|--|
| 1 | $\phi V6$ | Vertical shift register clock pulse (6) | 15 | VDD | Power supply |
| 2 | $\phi V5C$ | Vertical shift register clock pulse (5C) | 16 | VO | CCD output |
| 3 | $\phi V5B$ | Vertical shift register clock pulse(5B) | 17 | GND | GND |
| 4 | $\phi V5A$ | Vertical shift register clock pulse(5A) | 18 | ϕRG | Reset pulse |
| 5 | $\phi V34$ | Vertical shift register clock pulse(4) | 19 | PT | P-Well |
| 6 | $\phi V3C$ | Vertical shift register clock pulse(3C) | 20 | SUBSW | Substrate control |
| 7 | $\phi V3B$ | Vertical shift register clock pulse(3B) | 21 | ϕV_{sub} | Substrate |
| 8 | $\phi V3A$ | Vertical shift register clock pulse(3A) | 22 | ϕHL | Horizontal shift register clock pulse |
| 9 | $\phi V2$ | Vertical shift register clock pulse(2) | 23 | $\phi V3R$ | Vertical shift register clock pulse(1C) |
| 10 | $\phi V1C$ | Vertical shift register clock pulse(1C) | 24 | $\phi V3L$ | Vertical shift register clock pulse(1B) |
| 11 | $\phi V1B$ | Vertical shift register clock pulse(1B) | 25 | $\phi V5R$ | Vertical shift register clock pulse(1A) |
| 12 | $\phi V1A$ | Vertical shift register clock pulse(1A) | 26 | $\phi V5L$ | Vertical shift register clock pulse(1S) |
| 13 | $\phi V1S$ | Vertical shift register clock pulse(1S) | 27 | $\phi H1$ | Horizontal shift register clock pulse(1) |
| 14 | GND | GND | 28 | $\phi H2$ | Horizontal shift register clock pulse(2) |

■ Pin Arrays



■ Device Parameter

| Parameter | Value | Unit |
|--|---|-----------|
| Total pixel number | $3,738 (H) \times 2,776 (V) = 10,369,212$ | pixel |
| Effective pixel number (Transient exist) | $3,676 (H) \times 2,764 (V) = 10,134,720$ | pixel |
| Active pixel number | $3,664 (H) \times 2,752 (V) = 10,083,328$ | pixel |
| Pixel dimension | $2.000 (H) \times 2.000 (V)$ | μm^2 |
| Image sensing block dimension | $7.328 (H) \times 5.504 (V)$ | mm^2 |

Optical Characteristics

| Parameter | Symbol | Condition | Min | Typ | Max | Unit |
|-------------------|--------|-----------|-----|-----|-----|------|
| Saturation output | Vsat | - | - | 550 | - | mV |
| Sensitivity | SoG | - | - | 230 | - | mV |
| Smear | Sm | - | - | -83 | - | dB |

Package

