MN37770KT

4.5mm (type-1/4) 350k pixel CCD Area Image Sensor
(Progressive scan structure)

■ Overview

The MN37770KT is a type-1/4 350k-pixel progressive-scan CCD with square pixels. Progressive-scanning enables you to read out all pixel signals separately in one vertical scanning period. Square pixels of 5.6μm × 5.6μm make image processing easier, such as rotation. Adopting complementary color filter array on chip provides excellent color reproduction.

Part Number	Size	System	Color or B/W
MN37770KT	4.5mm(type-1/4)	PS	Color

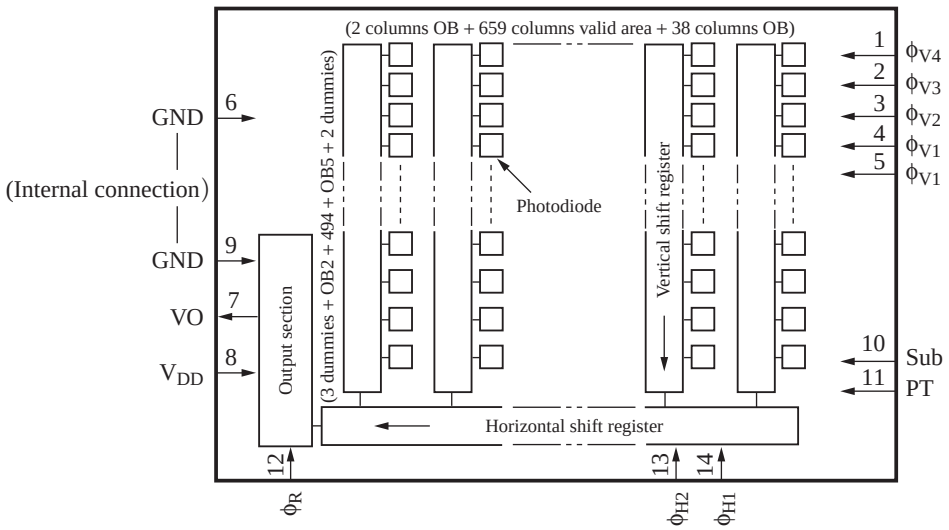
■ Features

- Square-pixelphoto diode arrangement
- VGA compatible pixels (640H × 480V)
- 1/4-type image format
- Progressive-scan structure
- Single channel horizontal CCD

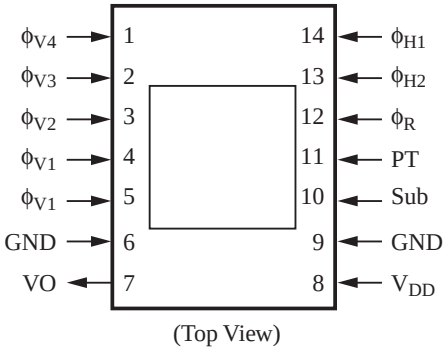
■ Applications

- Image capture system for PC (VGA compatible). Electoronic still camera. Video input method for factory automation

■ Block Diagram



■ Pin Assignments



(Top View)

■ Pin Descriptions

Pin No.	Symbol	Descriptions	Pin No.	Symbol	Descriptions
1	ϕ_{V4}	Vertical shift register clock pulse 4	6	GND	GND
			7	VO	Video output
2	ϕ_{V3}	Vertical shift register clock pulse 3	8	V_{DD}	Power supply
			9	GND	GND
3	ϕ_{V2}	Vertical shift register clock pulse 2	10	Sub	Substrate
			11	PT	P-well for protection circuit
4	ϕ_{V1}	Vertical shift register clock pulse 1	12	ϕ_{R}	Reset pulse
			13	ϕ_{H2}	Horizontal register clock pulse 2
5	ϕ_{V1}	ϕ_{V} Test pin *1	14	ϕ_{H1}	Horizontal register clock pulse 1

Note) *1: Exclusive driver for Pin 5 is not required. Connect to ϕV1 (Pin 4) with external wiring.

■ Absolute Maximum Ratings and Operating Conditions

Parameter		Symbol	Rating		Operating condition			Unit
			min	max	min	typ	max	
Power supply voltage		V_{DD}	– 0.2	18.0	14.5	15.0	15.5	V
Protection P-well voltage		V_{PT} *2	– 10.0	0.2	– 7.5	– 7.0	– 6.5	V
GND		GND	Reference voltage		—	0	—	V
Reset	H-L	$V_{\phi R(H-L)}$ *3	—	15.0	3.0	3.3	3.6	V
pulse voltage	Bias	$V_{\phi R(Bias)}$ *3	– 0.2	—	Supplied internally			V
Horizontal register		$V_{\phi H1(H)}$	—	18.0	3.0	3.3	3.6	V
clock pulse voltage 1		$V_{\phi H1(L)}$	– 0.2	—	– 0.2	0	0.2	
Horizontal register		$V_{\phi H2(H)}$	—	18.0	3.0	3.3	3.6	V
clock pulse voltage 2		$V_{\phi H2(L)}$	– 0.2	—	– 0.2	0	0.2	
Vertical shift register		$V_{\phi V1(H)}$ *2	—	18.0	14.5	15.0	15.5	V
clock pulse voltage 1		$V_{\phi V1(M)}$ *2	—	—	– 0.2	0	0.2	
		$V_{\phi V1(L)}$ *2	– 9.0	—	– 7.5	– 7.0	– 6.5	
Vertical shift register		$V_{\phi V2(M)}$ *2	—	15.0	– 0.2	0	0.2	V
clock pulse voltage 2		$V_{\phi V2(L)}$ *2	– 9.0	—	– 7.5	– 7.0	– 6.5	
Vertical shift register		$V_{\phi V3(M)}$ *2	—	15.0	– 0.2	0	0.2	V
clock pulse voltage 3		$V_{\phi V3(L)}$ *2	– 9.0	—	– 7.5	– 7.0	– 6.5	
Vertical shift register		$V_{\phi V4(M)}$ *2	—	15.0	– 0.2	0	0.2	V
clock pulse voltage 4		$V_{\phi V4(L)}$ *2	– 9.0	—	– 7.5	– 7.0	– 6.5	
Substrate voltage		V_{Sub} *1	—	40	Supplied internally			V
		ϕV_{Sub} *4	– 0.2	—	21.5	22.0	22.5	
Operating temperature		T_{opr}	– 10	60	—	25	—	°C
Storage temperature		T_{stg}	– 30	70	—	—	—	°C

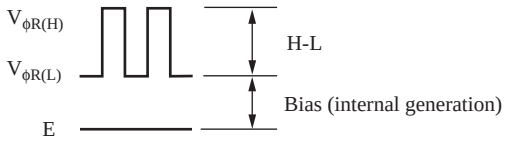
Note) 1. Standard light input defines

Standard light input is the one when the exposure is done at a lens aperture of F8, using a light source of 2856 K and 1050 nt, and placing a color temperature conversion filter LB-40 (HOYA) and an IR cutting filter CAW-500 (t = 2.5 mm) in the light path.

2. *1: V_{Sub} internal settings guarantee blooming at 400 times light input of the standard light input.
3. *2: V_{PT} is set so that the following conditions are set for VL of the vertical shift clock.

$V_{PT} \leqq VL$

4. *3:



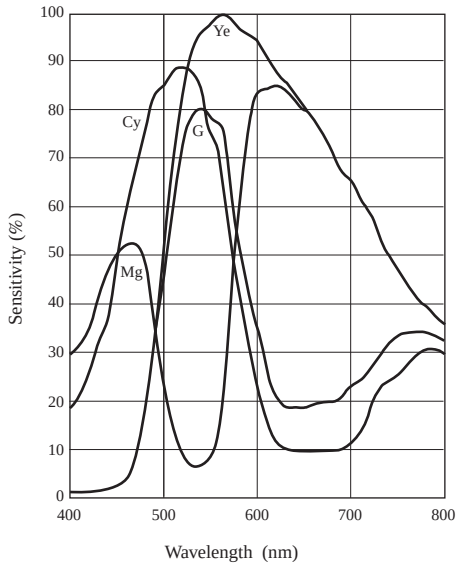
5. *4: V_{Sub} when using electronic shutter function.

■ Optical Characteristics

Part Number	Color or B/W	Effective pixels H	Effective pixels V	S/N typ (dB)	Saturation output typ (mV)	Sensitivity F8 typ (mV)	Vertical smear Sm typ(%)	Image lag typ (%)	Horizontal resolution typ (TV-lines)	Vertical resolution typ (TV-lines)
MN37770KT	Color	659	494	55	450	160	0.06	—	—	—

■ Graphs of Characteristics

CCD On-Chip Filter Spectral Responsive Characteristics



■ Package Dimensions (Unit:mm)

• WDIP014-P-0400F