

MN37214FT

4.5mm (type-1/4) CCD Area Image Sensor

■ Overview

The MN37214FT is a 4.5mm (type-1/4) interline transfer CCD (IT-CCD) solid state image sensor device.

This device uses photodiodes in the optoelectric conversion section and CCDs for signal read out. The electronic shutter function has made an exposure time of 1/10000 seconds possible. Further, this device has the features of high sensitivity, low noise, broad dynamic range, and low smear.

This device has a total of 320,589 pixels (537 horizontal × 597 vertical) and provides stable and clear images with a resolution of 330 horizontal TV-lines and 420 vertical TV-lines.

Part Number	Size	System	Color or B/W
MN37214FT	4.5mm(type-1/4)	PAL	Color



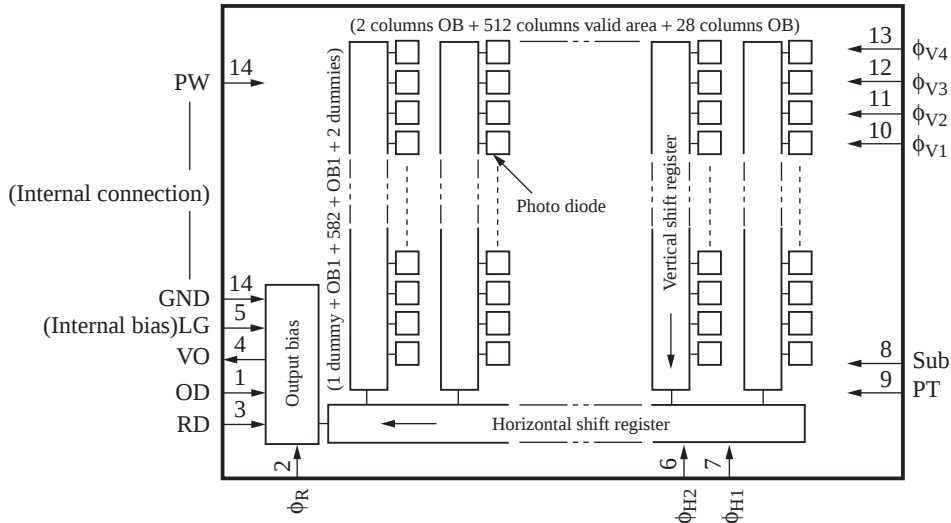
■ Features

- High sensitivity
- Low noise
- Broad dynamic range
- Low smear
- Low image lag
- Electronic shutter
- No image distortion
- Small size enables design of compact equipment
- High reliability
- 14-pin plastic package

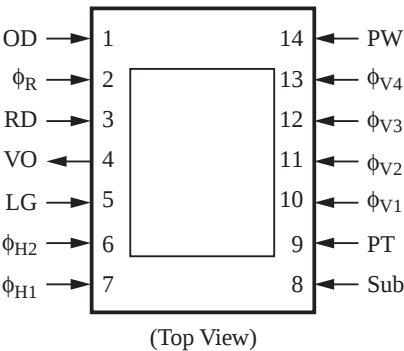
■ Applications

- Compact lightweight camcorders. Cameras for surveillance, measurement, and medical use

■ Block Diagram



■ Pin Assignments



■ Pin Descriptions

Pin No.	Symbol	Descriptions	Pin No.	Symbol	Descriptions
1	OD	Output drain	10	ϕ_{V1}	Vertical shift register clock pulse 1
2	ϕ_R	Reset pulse	11	ϕ_{V2}	Vertical shift register clock pulse 2
3	RD	Reset drain	12	ϕ_{V3}	Vertical shift register clock pulse 3
4	VO	Video output	13	ϕ_{V4}	Vertical shift register clock pulse 4
5	LG	Output load transistor gate			
6	ϕ_{H2}	Horizontal register clock pulse 2			
7	ϕ_{H1}	Horizontal register clock pulse 1			
8	Sub	Substrate			
9	PT	P-well for protection circuit	14	PW	P-well

Absolute Maximum Ratings and Operating Conditions

Parameter		Symbol	Rating		Operating condition			Unit
			min	max	min	typ	max	
Reset drain voltage		V _{RD}	− 0.2	18.0	14.5	15.0	15.5	V
Output drain voltage		V _{OD}	− 0.2	18.0	14.5	15.0	15.5	V
Output load transistor gate voltage		V _{LG}	Supplied internally					V
Protection P-well voltage		V _{PT} ^{*2}	− 10.0	0.2	− 8.3	− 8.0	− 7.7	V
P-well		V _{PW}	Reference Voltage		—	0	—	V
Reset pulse voltage	H-L	V _{φR(H-L)}	—	18.0	3.0	3.3	3.6	V
	Bias	V _{φR(Bias)}	6.4 V Outer added					V
Horizontal register clock pulse voltage 1		V _{φH1(H)}	—	18.0	3.0	3.3	3.6	V
		V _{φH1(L)}	− 0.2	—	0	0	0	
Horizontal register clock pulse voltage 2		V _{φH2(H)}	—	18.0	3.0	3.3	3.6	V
		V _{φH2(L)}	− 0.2	—	0	0	0	
Vertical shift register clock pulse voltage 1		V _{φV1(H)} ^{*2}	—	18.0	14.5	15.0	15.5	V
		V _{φV1(M)} ^{*2}	—	—	− 0.2	0	0.2	
		V _{φV1(L)} ^{*2}	− 9.0	—	− 8.3	− 8.0	− 7.7	
Vertical shift register clock pulse voltage 2		V _{φV2(M)} ^{*2}	—	15.0	− 0.2	0	0.2	V
		V _{φV2(L)} ^{*2}	− 9.0	—	− 8.3	− 8.0	− 7.7	
Vertical shift register clock pulse voltage 3		V _{φV3(H)} ^{*2}	—	18.0	14.5	15.0	15.5	V
		V _{φV3(M)} ^{*2}	—	—	− 0.2	0	0.2	
		V _{φV3(L)} ^{*2}	− 9.0	—	− 8.3	− 8.0	− 7.7	
Vertical shift register clock pulse voltage 4		V _{φV4(M)} ^{*2}	—	15.0	− 0.2	0	0.2	V
		V _{φV4(L)} ^{*2}	− 9.0	—	− 8.3	− 8.0	− 7.7	
Substrate voltage		V _{Sub} ^{*1}	Supplied internally					V
		φV _{Sub} ^{*3}	− 0.2	45.0	24.5	25.0	25.5	
Operating temperature		T _{opr}	− 10	70	—	25	—	°C
Storage temperature		T _{stg}	− 30	80	—	—	—	°C

Note)1. Standard light input defines

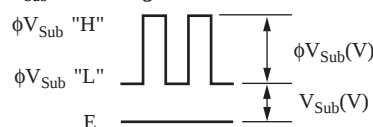
Standard light input is the one when the exposure is done at a lens aperture of F8, using a light source of 2856 K and 1050 nt, and placing a color temperature conversion filter LB-40 (HOYA) and an IR cutting filter CAW-500 ($t = 2.5$ mm) in the light path.

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.

$$V_{PT} \leq V_L$$

4. *3: V_{Sub} when using electronic shutter function

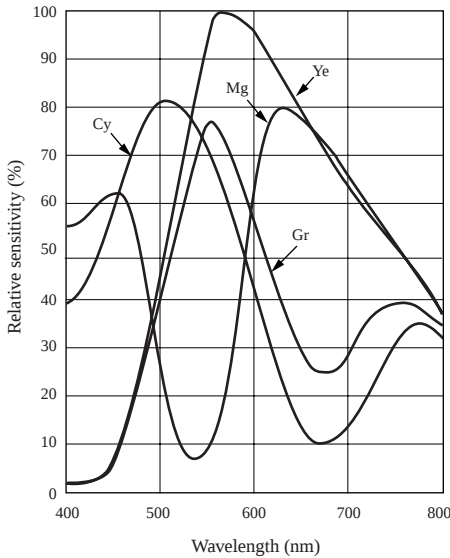


■ Optical Characteristics

Part Number	Color or B/W	Effective pixels		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)
		H	V							
MN37214FT	Color	512	582	58	650	330	0.003	—	330	420

■ Graphs of Characteristics

CCD On-Chip Filter Spectral Characteristics



■ Package Dimensions (Unit:mm)

- WDIP014-P-0400F

