

MN37214FT

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

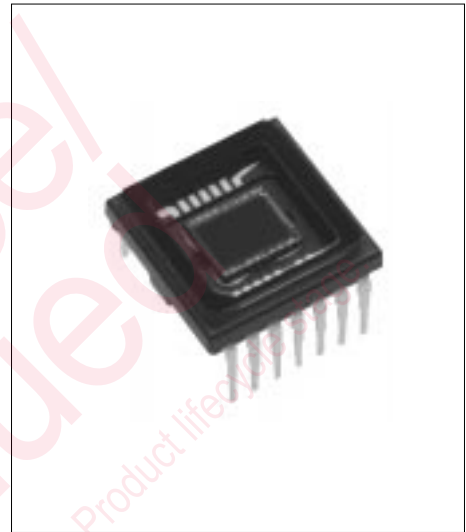
■ Overview

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



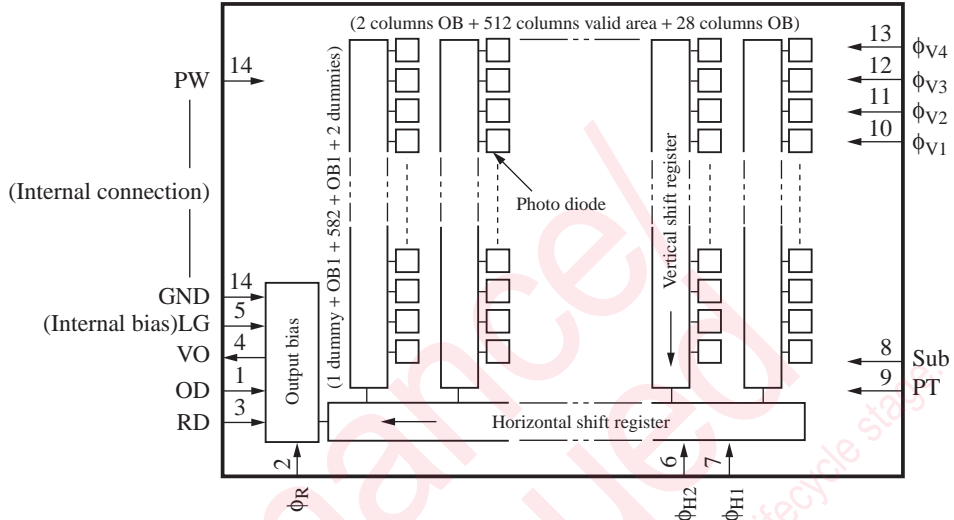
■ Features

- 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

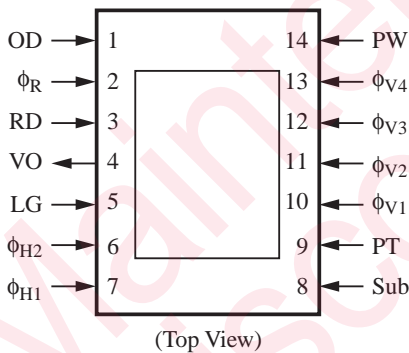
■ Applications

- 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	phi_V1	Vertical shift register clock pulse 1
2	phi_R	Reset pulse	11	phi_V2	Vertical shift register clock pulse 2
3	RD	Reset drain	12	phi_V3	Vertical shift register clock pulse 3
4	VO	Video output	13	phi_V4	Vertical shift register clock pulse 4
5	LG	Output load transistor gate	14	PW	P-well
6	phi_H2	Horizontal register clock pulse 2			
7	phi_H1	Horizontal register clock pulse 1			
8	Sub	Substrate			
9	PT	P-well for protection circuit			

■ 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	$V_{\phi R(H-L)}$	—	18.0	3.0	3.3	3.6	V
	Bias	$V_{\phi R(Bias)}$	6.4 V Outer added					V
Horizontal register clock pulse voltage 1		$V_{\phi H1(H)}$	—	18.0	3.0	3.3	3.6	V
		$V_{\phi H1(L)}$	-0.2	—	0	0	0	
Horizontal register clock pulse voltage 2		$V_{\phi H2(H)}$	—	18.0	3.0	3.3	3.6	V
		$V_{\phi H2(L)}$	-0.2	—	0	0	0	
Vertical shift register clock pulse voltage 1		$V_{\phi V1(H)}^{*2}$	—	18.0	14.5	15.0	15.5	V
		$V_{\phi V1(M)}^{*2}$	—	—	-0.2	0	0.2	
		$V_{\phi V1(L)}^{*2}$	-9.0	—	-8.3	-8.0	-7.7	
Vertical shift register clock pulse voltage 2		$V_{\phi V2(M)}^{*2}$	—	15.0	-0.2	0	0.2	V
		$V_{\phi V2(L)}^{*2}$	-9.0	—	-8.3	-8.0	-7.7	
Vertical shift register clock pulse voltage 3		$V_{\phi V3(H)}^{*2}$	—	18.0	14.5	15.0	15.5	V
		$V_{\phi V3(M)}^{*2}$	—	—	-0.2	0	0.2	
		$V_{\phi V3(L)}^{*2}$	-9.0	—	-8.3	-8.0	-7.7	
Vertical shift register clock pulse voltage 4		$V_{\phi V4(M)}^{*2}$	—	15.0	-0.2	0	0.2	V
		$V_{\phi V4(L)}^{*2}$	-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

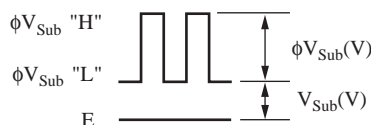
Note)1. Standard light input defines

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.

$$V_{PT} \leq VL$$

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

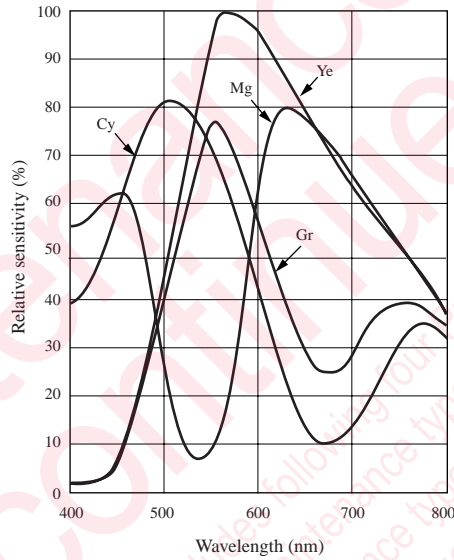


■ Optical Characteristics

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

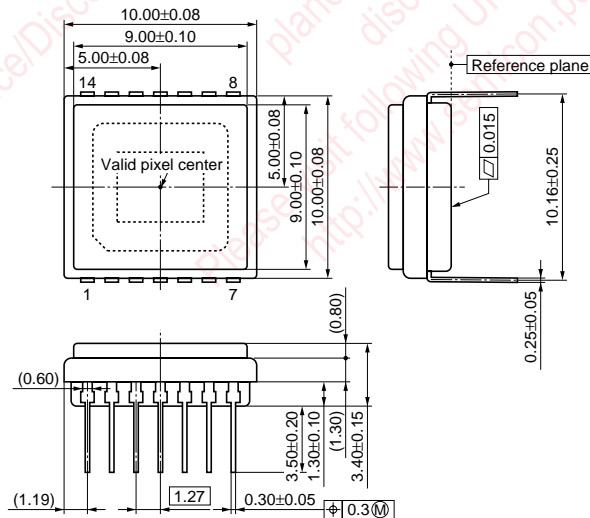
■ Graphs of Characteristics

CCD On-Chip Filter Spectral Characteristics



■ Package Dimensions (Unit: mm)

- WDIP014-P-0400F



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