

# MN37242FT

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

### ■ Overview

The MN37242FT 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 557,295 pixels and provides stable and clear images with a resolution of 480 horizontal TV-lines and 420 vertical TV-lines.



Part Number	Size	System	Color or B/W
MN37242FT	4.5mm(type-1/4)	PAL	Color

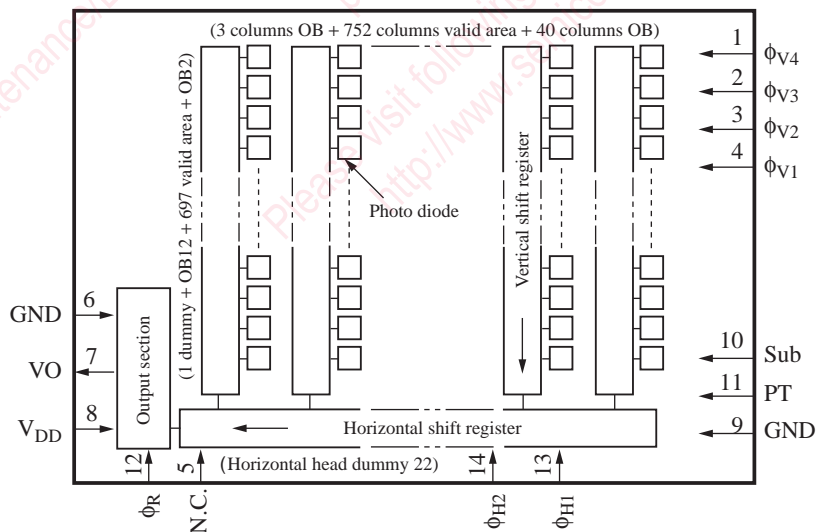
### ■ Features

- 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

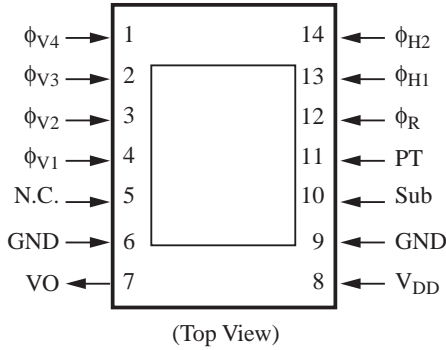
### ■ Applications

- 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	$\phi_{V4}$	Vertical shift register clock pulse 4	6	GND	GND
			7	VO	Video Output
2	$\phi_{V3}$	Vertical shift register clock pulse 3	8	$V_{DD}$	Power supply
			9	GND	GND
3	$\phi_{V2}$	Vertical shift register clock pulse 2	10	Sub	Substrate
			11	PT	P-well for protection circuit
4	$\phi_{V1}$	Vertical shift register clock pulse 1	12	$\phi_R$	Reset pulse (RG)
			13	$\phi_{H1}$	Horizontal register clock pulse 1
5	N.C.	N.C.	14	$\phi_{H2}$	Horizontal register clock pulse 2

■ 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	-7.8	-7.5	-7.2	V	
GND	GND	Reference voltage		—	0	—	V	
Reset pulse voltage	H-L	$V_{\phi R(H-L)}$	—	18.0	3.0	3.3	5.5	V
	Bias	$V_{\phi R(Bias)}$	Supplied internally				V	

■ Absolute Maximum Ratings and Operating Conditions (continued)

Parameter	Symbol	Rating		Operating condition			Unit
		min	max	min	typ	max	
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	—	-0.05	0	0.05	
Horizontal register clock pulse voltage 2	$V_{\phi H2(H)}$	—	18.0	3.0	3.3	—	V
	$V_{\phi H2(L)}$	-0.2	—	-0.05	0	0.05	
Vertical shift register clock pulse voltage 1	$V_{\phi V1(H)}^{*2}$	—	18.0	14.5	15.0	15.5	V
	$V_{\phi V1(M)}^{*2}$	—	—	-0.05	0	0.05	
	$V_{\phi V1(L)}^{*2}$	-9.0	—	-7.8	-7.5	-7.2	
Vertical shift register clock pulse voltage 2	$V_{\phi V2(M)}^{*2}$	—	15.0	-0.05	0	0.05	V
	$V_{\phi V2(L)}^{*2}$	-9.0	—	-7.8	-7.5	-7.2	
Vertical shift register clock pulse voltage 3	$V_{\phi V3(H)}^{*2}$	—	18.0	14.5	15.0	15.5	V
	$V_{\phi V3(M)}^{*2}$	—	—	-0.05	0	0.05	
	$V_{\phi V3(L)}^{*2}$	-9.0	—	-7.8	-7.5	-7.2	
Vertical shift register clock pulse voltage 4	$V_{\phi V4(M)}^{*2}$	—	15.0	-0.05	0	0.05	V
	$V_{\phi V4(L)}^{*2}$	-9.0	—	-7.8	-7.5	-7.2	
Substrate voltage	$V_{Sub}^{*1}$	Supplied internally					V
	$\Delta V_{Sub}^{*3}$	-0.2	45.0	22.0	22.5	23.0	
Operating temperature	$T_{opr}$	-10	70	—	25	—	°C
Storage temperature	$T_{stg}$	-30	80	—	—	—	°C

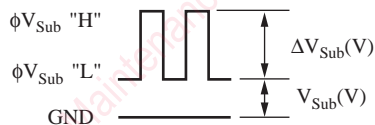
Note)1. Standard light input defines

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

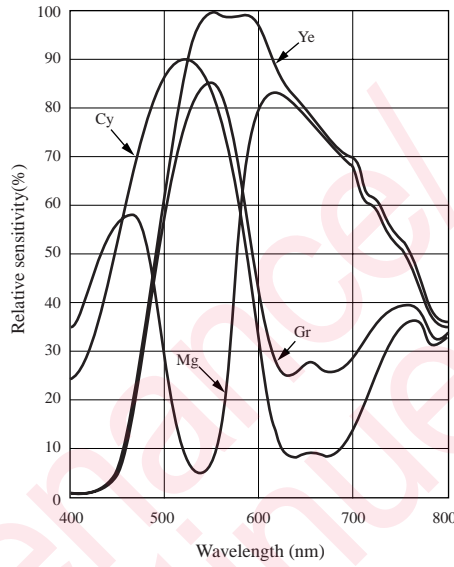


■ Optical Characteristics

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							
MN37242FT	Color	752	697	—	500	160	0.03	—	480	420

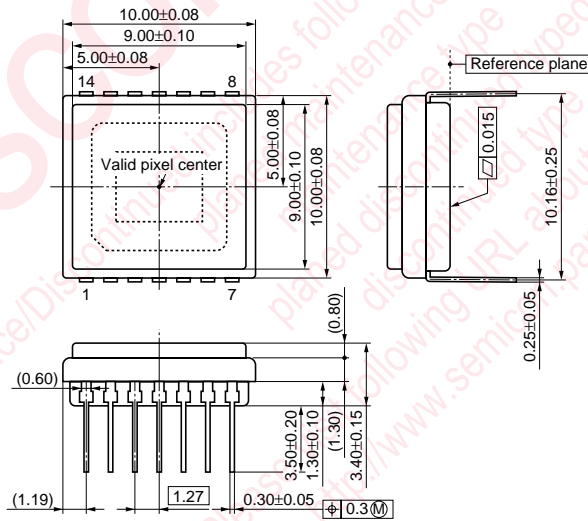
■ Graphs of Characteristics

CCD Spectral Responsive Characteristics



■ Package Dimensions (Unit: mm)

- WDIP014-P-0400F



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