MN371132FT

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

■ Overview

The MN371132FT 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 271,185 pixels (537 horizontal × 505 Vertical) and provides stable and clear images with a resolution of 330 horizontal TV-lines and 350 vertical TV-lines.

Part Number	Size	System	Color or B/W
MN371132FT	4.5mm(type-1/4)	NTSC	Color

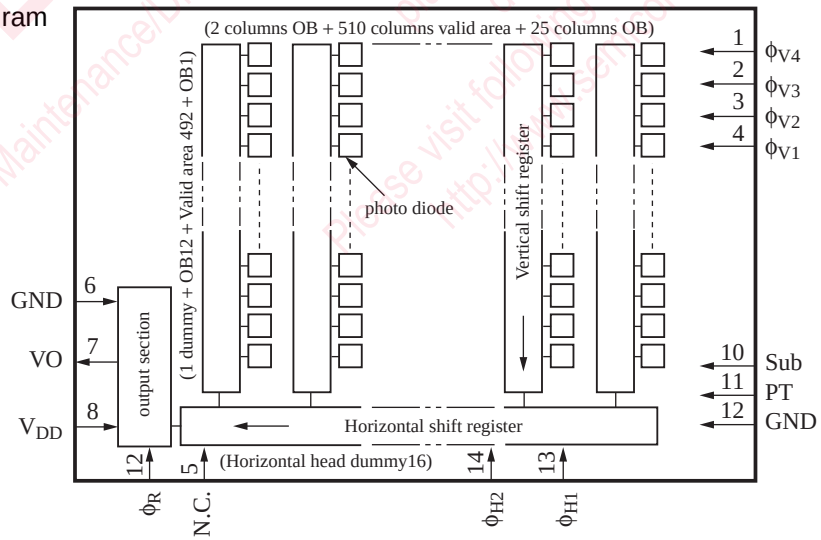
■ Features

- 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

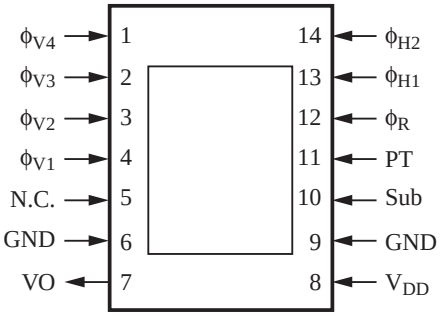
■ Applications

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

■ Block Diagram



■ Pin Assignments



(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_{H1}	Horizontal register clock pulse 1
5	N.C.	N.C.	14	ϕ_{H2}	Horizontal register clock pulse 2

■ Absolute Maximum Ratings and Operating Conditions

Parameter		Symbol	Rating min	Rating max	Operating condition min	Operating condition typ	Operating condition max	Unit
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	– 7.3	– 7.0	– 6.7	V
GND		GND	Reference voltage		—	0	—	V
Reset pulse voltage	H-L	$V_{\phi R(H-L)}$	—	18.0	3.0	3.3	3.6	V
	Bias	$V_{\phi R(Bias)}$	Supplied internally					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	—	– 0.05	0	0.05	
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	—	– 0.05	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	—	—	– 0.2	0	0.2	
		$V_{\phi V1(L)}$ *2	– 9.0	—	– 7.3	– 7.0	– 6.7	
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	—	– 7.3	– 7.0	– 6.7	
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	—	– 7.3	– 7.0	– 6.7	
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	—	– 7.3	– 7.0	– 6.7	
Substrate voltage		V_{Sub} *1	Supplied internally					V
		ϕV_{Sub} *3	– 0.2	45.0	21.5	22.0	22.5	
Operating temperature		T_{opr}	– 10	70	—	25	—	°C
Storage temperature		T_{stg}	– 30	80	—	—	—	°C

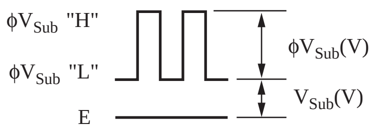
Note) 1. Standard light input defines

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.

   $V_{PT} \leqq VL$

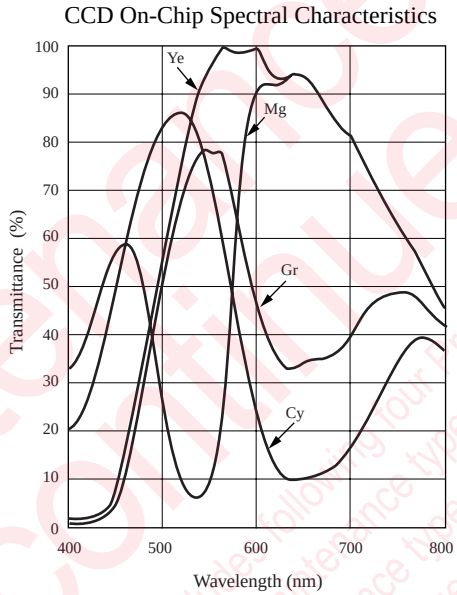
4. *3: V_{Sub} when using electronic shutter function



■ Optical Characteristics

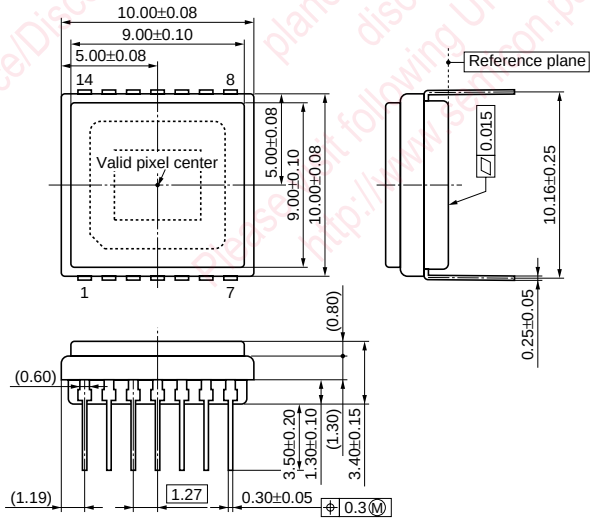
Part Number	Color or B/W	Effective pixels H	Effective pixels V	S/N typ (dB)	Saturation output typ (mV)	Sensitivity F8 typ (mV)	Vertical smear Sm typ(%)	Image lag typ (%)	Horizontal resolution typ (TV-lines)	Vertical resolution typ (TV-lines)
MN371132FT	Color	510	492	58	650	330	0.003	—	330	350

■ Graphs of Characteristics



■ Package Dimensions (Unit : mm)

• WDIP014-P-0400F



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