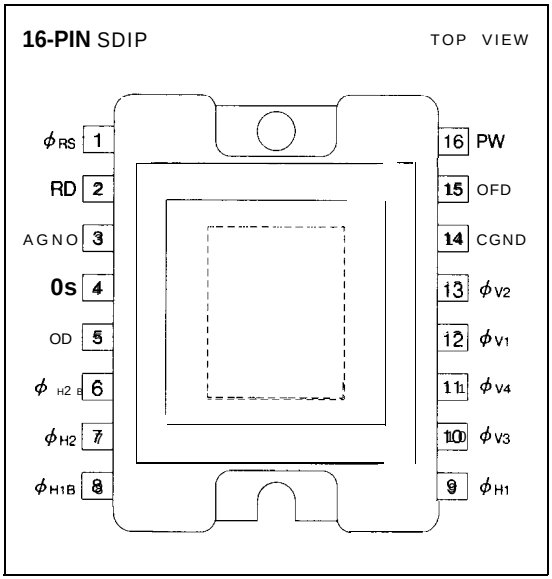
LZ23242J

1/3 type B/W CCD Area Sensor for CCIR

DESCRIPTION

LZ23242J is a 1/3-type (6.0 mm) solid state image sensor that consists of PN phote-diodes and CCDS (charge-coupled devices). Having approximately 320000 pixels (horizontal 542 x vertical 562), the sensor provides a high resolution stable B/W normal or mirror image.

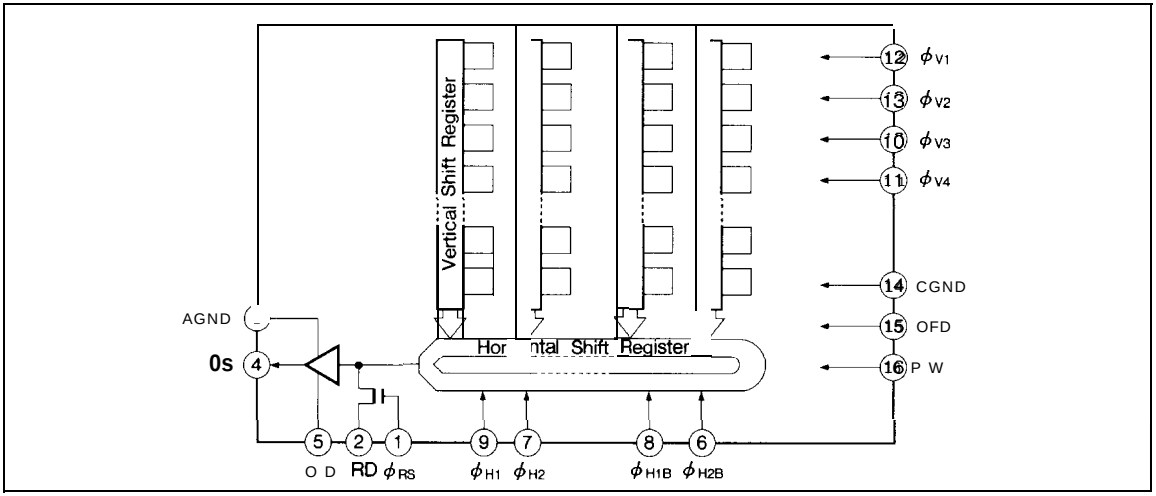
PIN CONNECTIONS



FEATURES

- Number of pixels : 512 (H) x 582 (V)
  Pixel pitch : 9.6 μm (H) x 6.3 μm (V)
  Number of optical black pixels
  : Horizontal; front 2 and rear 28
- Low fixed pattern noise and lag
- No sticking and no image distortion
- Blooming suppression structure
- Built-in output amplifier
- Variable electronic shutter (1 /50 to 1/1 O 000 s)
- Compatible with CCIR standard
- Normal or mirror image output available from common output terminal
- Package : 16-pin SDIP[CERDIP](WDIP016-N-0500B)

BLOCK DIAGRAM



PIN DESCRIPTION

SYMBOL	PIN NAME	NOTE
RD	Reset transistor drain	
OD	Output transistor drain	
0s	Video output	
ϕ_{RS}	Reset transistor gate clock	
$\phi_{V1}, \phi_{V2}, \phi_{V3}, \phi_{V4}$	Vertical shift register gate clock	
$\phi_{H1}, \phi_{H2}, \phi_{H1B}, \phi_{H2B}$	Horizontal shift register gate clock	1
OFD	Overflow drain	
PW	P type well	
AGND	Analog part ground	
CGND	Clock part ground	

NOTE :

1 **Normal image output mode :** $\phi_{H1} = \phi_{H1B}, \phi_{H2} = \phi_{H2B}$
Mirror image output mode : $\phi_{H1} = \phi_{H2B}, \phi_{H2} = \phi_{H1B}$

ABSOLUTE MAXIMUM RATINGS

(Ta = 25°C)

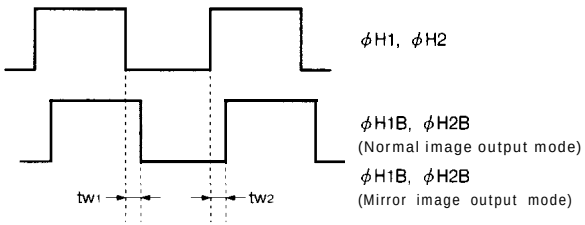
PARAMETER	SYMBOL	RATING	UNIT
Output transistor drain voltage	V_{OD}	Oto +18	V
Reset transistor drain voltage	V_{RD}	Oto +18	V
Overflow drain voltage	V_{OFD}	o to +55	V
Reeat gate clock voltage	$V_{\phi RS}$	−0.3 to +18	V
Vertical shift register clock voltage	$V_{\phi V}$	−9.0 to +18	V
Horizontal shift register clock voltage	$V_{\phi H}$	−0.3 to +18	V
Voltage difference between PW and vertical clink	$V_{PW} - V_{\phi V}$	−27 to O	V
Storage temperature	Tstg	−40 to +85	°C
Operating ambient temperature	Topr	−20 to +70	°C

RECOMMENDED OPERATING CONDITIONS

PARAMETER		SYMBOL	MIN.	TYP.	MAX.	UNIT	NOTE
Operating ambient temperature		Topr		25.0		°C	
Output transistor drain voltage		V_{OD}	14.5	15.0	**16.0**	**v**	
Reset transistor drain voltage		V_{RD}		V_{OD}		v	
Overflow drain voltage	When DC is applied	Vom	**5.0**		19.0	**v**	1
	When pulse is applied p-p level	$V_{\phi OFD}$	22.0			v	2
Analog part ground voltage		AGND		0.0		v	
Clock part ground voltage		CGND		0.0		v	
P-well voltage		VPW	–9,0		$V_{\phi VL}$	V	
Vertical shift register clock	LOW level	$V_{\phi V1-4L}$	- 8.5	– 8.0	–7.5	v	
	INTERMEDIATE level	$V_{\phi V1-4I}$		0.0		v	
	HIGH level	$V_{\phi V1H}$, $V_{\phi V3H}$	16,0	16,5	17.0	v	
Horizontal shift register clock	LOW level	$V_{\phi H1-2L}$, $V_{\phi H1B-2BL}$	– 0.05	0.0	0.05	V	
	HIGH level	$V_{\phi H1-2H}$, $V_{\phi H1B-2BH}$	4.7	5.0	6.0	V	
Reset gate clock	LOW level	$V_{\phi RSL}$	0.0		V_{RD} – 12.0	v	
	HIGH level	$V_{\phi RSH}$	V_{RD} – 7.5		9.5	v	
Vertical shift register clock frequency		$f_{\phi V1-4}$		15.63		kHz	
Horizontal shift register clock frequency		$f_{\phi H1-2}$, $f_{\phi H1B-2B}$		9.66		MHz	
Reset gate clock frequency		$f_{\phi RS}$		9.66		MHz	
Horizontal shift register clock phase		twl, tw2	0.0	5.0	10.0	ns	3

NOTES :

1. When DC voltage is applied, shutter speed is 1 /50 seconds,
2. When pulse IS applied, shutter speed is less than 1 /50 seconds
3.



ELECTRICAL CHARACTERISTICS (Drive method: Field Accumulation)

(Ta = 25°C, Operating conditions : typical values for the recommended operating conditions, Color temperature of light source : 3200 K / IR cut-off filter (CM-500, 1 mmt))

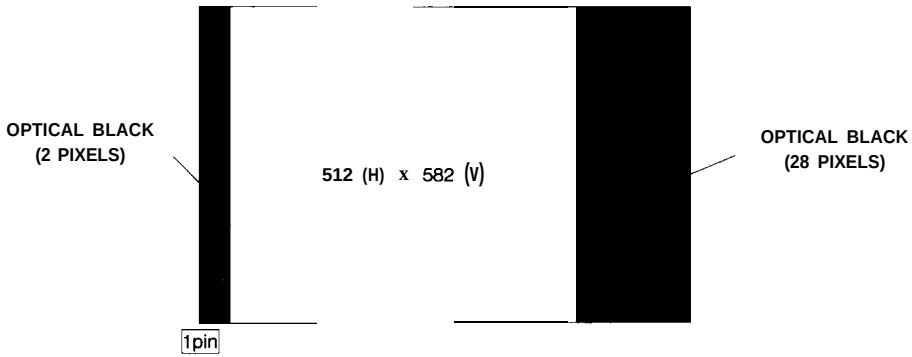
PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	NOTE
Photo response non-uniformity	PRNU			10	%	2
Saturation signal	Vsat	450			mV	3
Dark output voltage	Vdark		0.3	3.0	mV	1, 4
Dark signal non-uniformity	DSNU		0.6	2.0	mV	1, 5
Sensitivity	R	360	500		mV	6
Gamma	Y		1			
Smear ratio	SMR		0.009	0.016	%	7
Image lag	AI			1,0	%	8
Blooming suppression ratio	ABL	1000				9
Output transistor drain current	I_{OD}		4.0	8.0	mA	
Output impedance	R_O		300		Ω	
Dark noise	Vnoise		0.2	0.4	mV	10
OB difference in level				1.0	mV	11

- The standard output voltage is defined as 150 mV by the average output voltage under uniform illumination.
- The standard exposure level is defined when the average output voltage is 150 mV under uniform illumination.

NOTES :

1. Ta : +60°C
2. The image area is divided into 10X 10 segments. The segment's voltage is the average output voltage of all the pixels within the segment. PRNU is defined by (Vmax – Vmin)/Vo, where Vmax and Vmin are the maximum and the minimum values of each segment's voltage respectively, when the average output voltage Vo is 150 mV.
3. The image area is divided into 10x 10 segments. The saturation signal is defined as the minimum of each segment's voltage which is the average output voltage of all the pixels within the segment, when the exposure level is set as 10 times, compared to standard level.
4. The average output voltage under a non-exposure condition.
5. The image area is divided into 10X 10 segments. DSNU is defined by (Vdmex – Vdmin) under the non-exposure condition where Vdmax and Vdmin are the maximum and the minimum values of each segment's voltage, respectively, that is the average output voltage over all pixels in the segment.
6. The average output voltage when a 1000 lux light source attached with a 90% reflector is imaged by a lens of F4, f50 mm.
7. The sensor is adjusted to position a V/l O square at the center of image area where V is the vertical length of the image area. SMR is defined by the ratio of the output voltage detected during the vertical blanking period to the maximum of the pixel voltage m the V/l O square.
8. The sensor is exposed at the exposure level corresponding to the standard condition preceding non-exposure condition. AI is defined by the ratio between the output voltage measured at the Ist field during the non-exposure period and the standard output voltage.
9. The sensor is adjusted to position a V/l O square at the center of image area. ABL is the ratio between the exposure at the standard condition and the exposure at a point where a blooming is observed.
10. The RMS value of the dark noise (after CDS). The bandwidth range is from 100 kHz to 5.0 MHz.
11. The difference between the average output voltage of the effective area and the OB part under the non-exposure condition.

PIXEL STRUCTURE

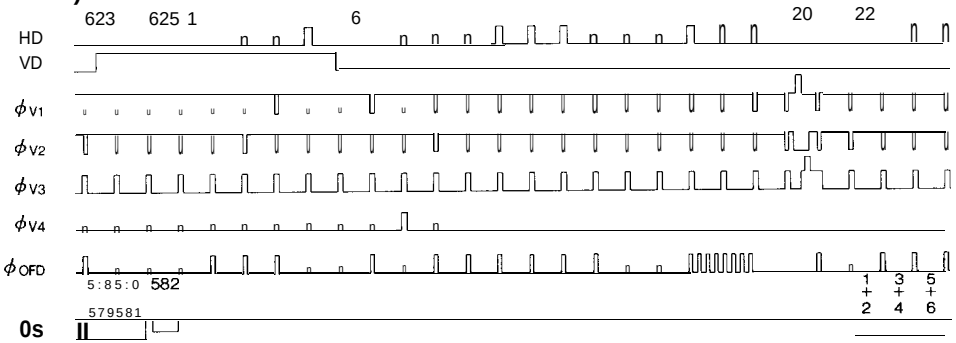


TIMING DIAGRAM EXAMPLE

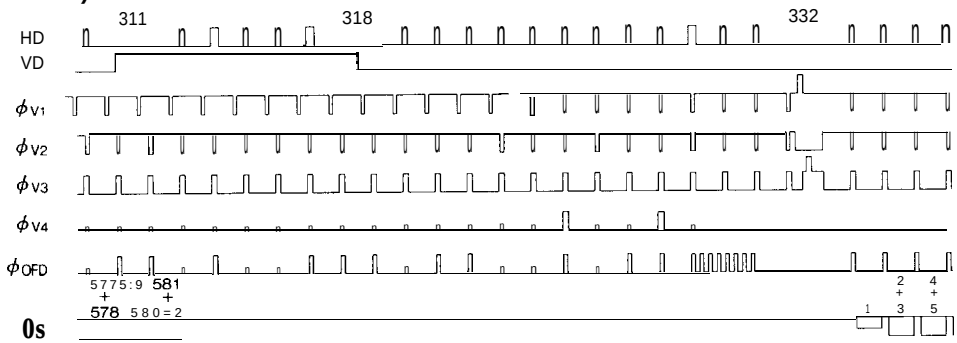
VERTICAL TRANSFER TIMING < NORMAL OUTPUT >

Shutter speed 1/10000 s

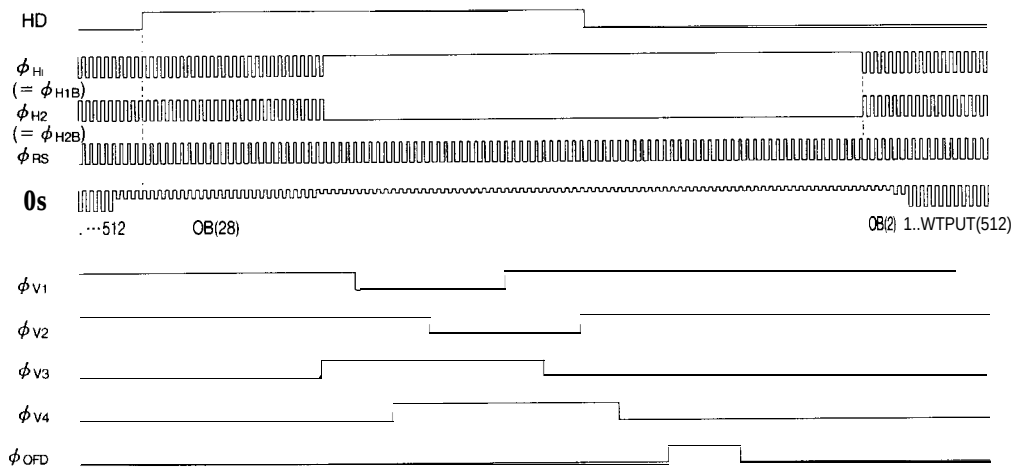
(1st, 3rd FIELD)



(2nd, 4th FIELD)



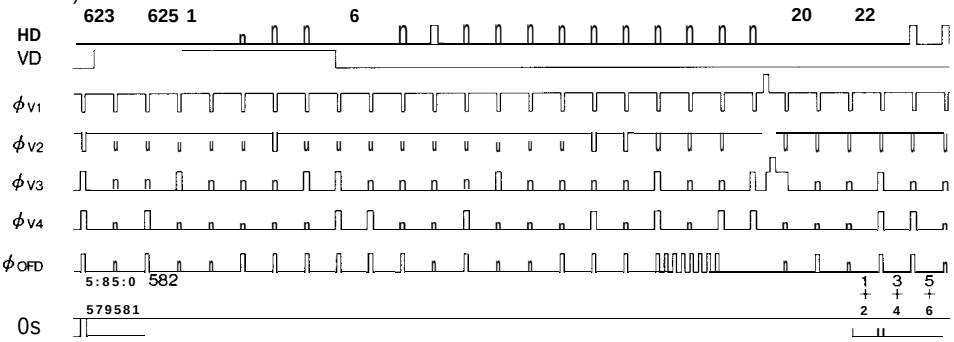
HORIZONTAL TRANSFER TIMING < NORMAL OUTPUT >



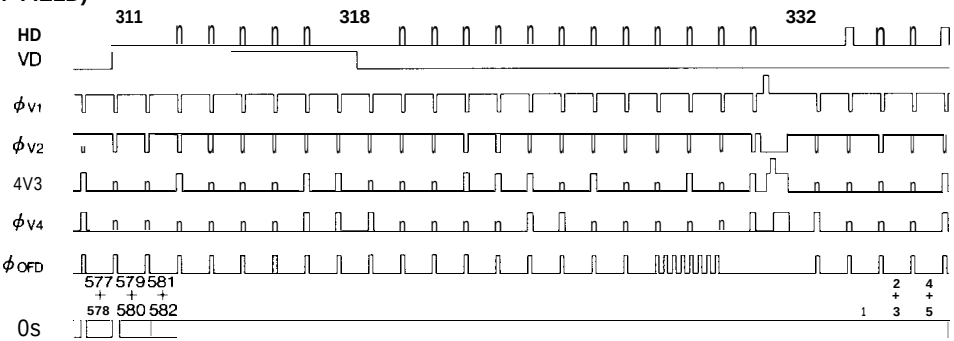
VERTICAL TRANSFER TIMING < MIRROR OUTPUT >

Shutter speed 1/10000 s

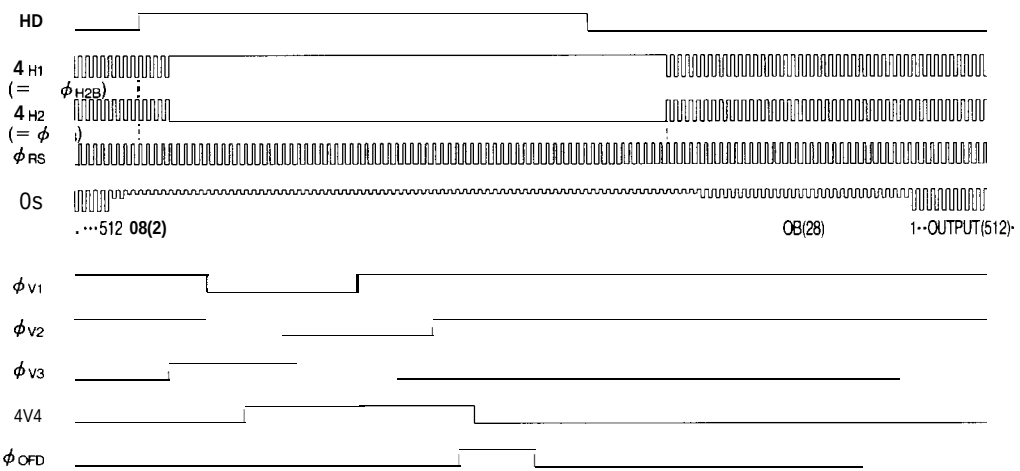
(1st, 3rd FIELD)



(2nd, 4th FIELD)



HORIZONTAL TRANSFER TIMING < MIRROR OUTPUT >



SYSTEM CONFIGURATION EXAMPLE