

MW3759MAE

11mm (type-2/3) Wide CCD Area Image Sensor

Overview

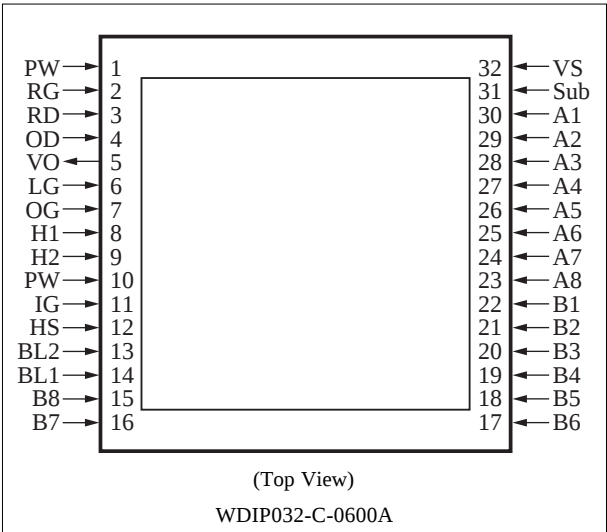
The MW3759MAE is a 11mm (type-2/3) Multiple Frame interline transfer CCD (M-FIT-CCD) solid state image sensor device.

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 638,810 pixels (1,270 horizontal × 503 vertical) and provides stable and clear images with a resolution of 850 horizontal TV-lines and 350 vertical TV-lines.

Part Number	Size	System	Color or B/W
MW3759MAE	11mm(type-2/3)	NTSC	B/W



Features

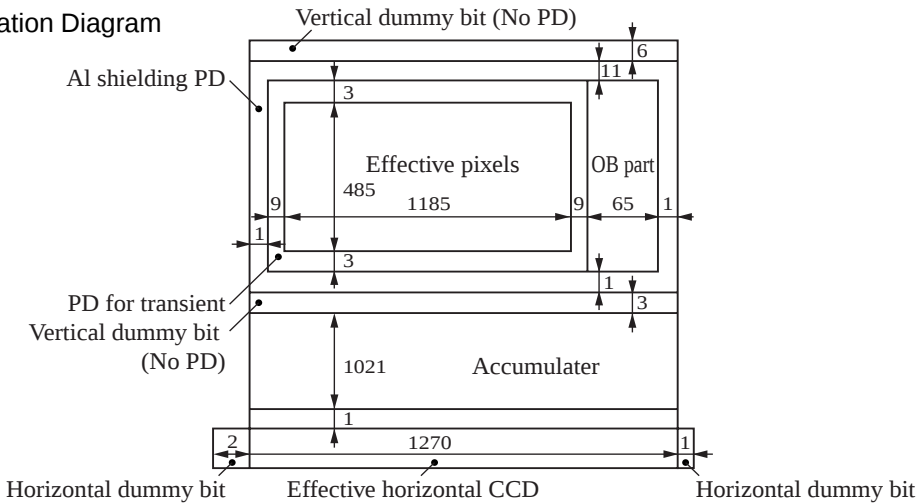
- Total number of pixels:
1,270 (horizontal) × 503 (vertical)
- High sensitivity
- Low noise
- Broad dynamic range
- Low smear
- Low image lag
- Electronic shutter
- No image distortion
- High reliability
- Aspect ratio 16:9
- 32-pin DIL package

Applications

- Cameras for broadcasting

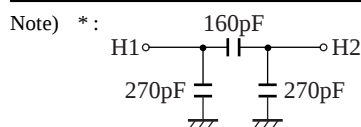
Device Configuration Diagram

(Unit : column)



■ Pin Descriptions

Pin No.	Symbol	Descriptions	Pin No.	Symbol	Descriptions
1	PW	P-well	17	B6	Accumulator vertical CCD gate
2	RG	Reset gate	18	B5	Accumulator vertical CCD gate
3	RD	Reset drain	19	B4	Accumulator vertical CCD gate
4	OD	Output drain	20	B3	Accumulator vertical CCD gate
5	VO	Video output	21	B2	Accumulator vertical CCD gate
6	LG	Load gate	22	B1	Accumulator vertical CCD gate
7	OG	Output gate	23	A8	Photo detector vertical CCD gate
8	H1*	Horizontal CCD gate 1	24	A7	Photo detector vertical CCD gate
9	H2*	Horizontal CCD gate 2	25	A6	Photo detector vertical CCD gate
10	PW	P-well	26	A5	Photo detector vertical CCD gate
11	IG	Horizontal input gate	27	A4	Photo detector vertical CCD gate
12	HS	Horizontal input source	28	A3	Photo detector vertical CCD gate
13	BL2	Accumulator final gate 2	29	A2	Photo detector vertical CCD gate
14	BL1	Accumulator final gate 1	30	A1	Photo detector vertical CCD gate
15	B8	Accumulator vertical CCD gate	31	Sub	Substrate
16	B7	Accumulator vertical CCD gate	32	VS	Vertical input source



■ Absolute Maximum Ratings and Operating Conditions

Parameter	Symbol	Rating		Operating condition			Unit
		min	max	min	typ	max	
P-well voltage	V_{PW}	Reference voltage		—	0	—	V
Reset gate voltage	RG(H)	—	20.0	4.7	5.0	5.3	V
	RG(L)	0	—	0	Adjust	10.0	
Reset drain voltage	RD	0	20.0	15.5	16.0	16.5	V
Output drain voltage	OD	0	20.0	15.5	16.0	16.5	V
Video output voltage	VO	—	—	—	—	—	—
Loadgate voltage	LG	0	20.0	1.7	2.0	2.3	V
Output gate voltage	OG	0	20.0	0.7	1.0	1.3	V
Horizontal CCD gate voltage 1	H1(H)	0	20.0	4.7	5.0	5.3	V
	H1(L)	0	—	—	0	—	
Horizontal CCD gate voltage 2	H2(H)	0	20.0	4.7	5.0	5.3	V
	H2(L)	0	—	—	0	—	
P-well voltage	PW	Reference voltage		—	0	—	V
Horizontal input gate voltage	IG	0	20.0	—	0	—	V

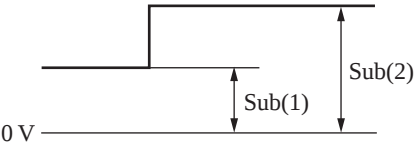
■ Absolute Maximum Ratings and Operating Conditions (continued)

Parameter	Symbol	Rating		Operating condition			Unit
		min	max	min	typ	max	
Horizontal input source voltage	HS	0	20.0	15.5	16.0	16.5	V
Accumulator final gate voltage 2	BL2(M)	—	20.0	1.7	2.0	2.3	V
	BL2(L)	−10.0	—	−9.3	−9.0	−8.7	
Accumulator final gate voltage 1	BL1(M)	—	20.0	0.7	1.0	1.3	V
	BL1(L)	−10.0	—	−9.3	−9.0	−8.7	
Accumulator vertical CCD gate (B8) voltage	B8(M)	—	20.0	1.7	2.0	2.3	V
	B8(L)	−10.0	—	−9.3	−9.0	−8.7	
Accumulator vertical CCD gate (B7) voltage	B7(M)	—	20.0	0.7	1.0	1.3	V
	B7(L)	−10.0	—	−9.3	−9.0	−8.7	
Accumulator vertical CCD gate (B6) voltage	B6(M)	—	20.0	1.7	2.0	2.3	V
	B6(L)	−10.0	—	−9.3	−9.0	−8.7	
Accumulator vertical CCD gate (B5) voltage	B5(M)	—	20.0	0.7	1.0	1.3	V
	B5(L)	−10.0	—	−9.3	−9.0	−8.7	
Accumulator vertical CCD gate (B4) voltage	B4(M)	—	20.0	1.7	2.0	2.3	V
	B4(L)	−10.0	—	−9.3	−9.0	−8.7	
Accumulator vertical CCD gate (B3) voltage	B3(M)	—	20.0	0.7	1.0	1.3	V
	B3(L)	−10.0	—	−9.3	−9.0	−8.7	
Accumulator vertical CCD gate (B2) voltage	B2(M)	—	20.0	1.7	2.0	2.3	V
	B2(L)	−10.0	—	−9.3	−9.0	−8.7	
Accumulator vertical CCD gate (B1) voltage	B1(M)	—	20.0	0.7	1.0	1.3	V
	B1(L)	−10.0	—	−9.3	−9.0	−8.7	
Photo detector vertical CCD gate (A8) voltage	A8(M)	—	20.0	1.7	2.0	2.3	V
	A8(L)	−10.0	—	−9.3	−9.0	−8.7	
Photo detector vertical CCD gate (A7) voltage	A7(H)	—	20.0	15.7	16.0	16.3	V
	A7(M)	—	20.0	0.7	1.0	1.3	
	A7(L)	−10.0	—	−9.3	−9.0	−8.7	
Photo detector vertical CCD gate (A6) voltage	A6(M)	—	20.0	1.7	2.0	2.3	V
	A6(L)	−10.0	—	−9.3	−9.0	−8.7	
Photo detector vertical CCD gate (A5) voltage	A5(H)	—	20.0	15.7	16.0	16.3	V
	A5(M)	—	20.0	0.7	1.0	1.3	
	A5(L)	−10.0	—	−9.3	−9.0	−8.7	
Photo detector vertical CCD gate (A4) voltage	A4(M)	—	20.0	1.7	2.0	2.3	V
	A4(L)	−10.0	—	−9.3	−9.0	−8.7	
Photo detector vertical CCD gate (A3) voltage	A3(H)	—	20.0	15.7	16.0	16.3	V
	A3(M)	—	20.0	0.7	1.0	1.3	
	A3(L)	−10.0	—	−9.3	−9.0	−8.7	

■ Absolute Maximum Ratings and Operating Conditions (continued)

Parameter	Symbol	Rating		Operating condition			Unit
		min	max	min	typ	max	
Photo detector vertical CCD gate (A2) voltage	A2(M)	—	20.0	1.7	2.0	2.3	V
	A2(L)	−10.0	—	−9.3	−9.0	−8.7	
Photo detector vertical CCD gate (A1) voltage	A1(H)	—	20.0	15.7	16.0	16.3	V
	A1(M)	—	20.0	0.7	1.0	1.3	
	A1(L)	−10.0	—	−9.3	−9.0	−8.7	
Substrate voltage*	Sub(1)	0	18.0	3.0	Adjust	16.0	V
	Sub(2)	0	40.0	37.5	38.0	38.5	
Vertical input source voltage	VS	0	20.0	15.5	16.0	16.5	V

Note)* : $V_{\text{Sub}(1)}$: DC component in normal operation
 $V_{\text{Sub}(2)}$: Shown in the diagram at the right
 (when electronic shutter operates)



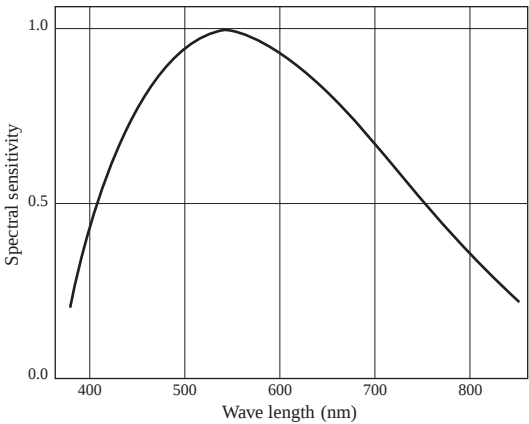
■ Image Characteristics

Part Number	Color or B/W	Effective pixels		S/N typ (−dB)	Saturation output typ (mV)			Standard output typ (mV)	Vertical smear typ (dB)	Image typ (%)
		H	V		R	G	B			
MW3759MAE	B/W	1185	485	62	1300	1300	1000	300	−125	0

Note) The V_{Sub} initial setting is 5.0V, and is adjusted to the minimum voltage when blooming does not occur at 1600 times the light input of standard light input, or the minimum voltage when injection does not occur. Standard light input is the one when exposure is done at a lens aperture of F11, using a light source of 2856K and 920nt, and placing a color temperature conversion filter LB-40 (HOYA) an IR cutting filter CAW-500S ($t = 2.5 \text{ mm}$) in the light path

■ Graphs of Characteristics

CCD Spectral Responsive Characteristics



■ Package Dimensions (Unit : mm)

- WDIP032-C-0600A

