HA11899MP

T-77-17

Fully Automatic White Balance for Video Cameras

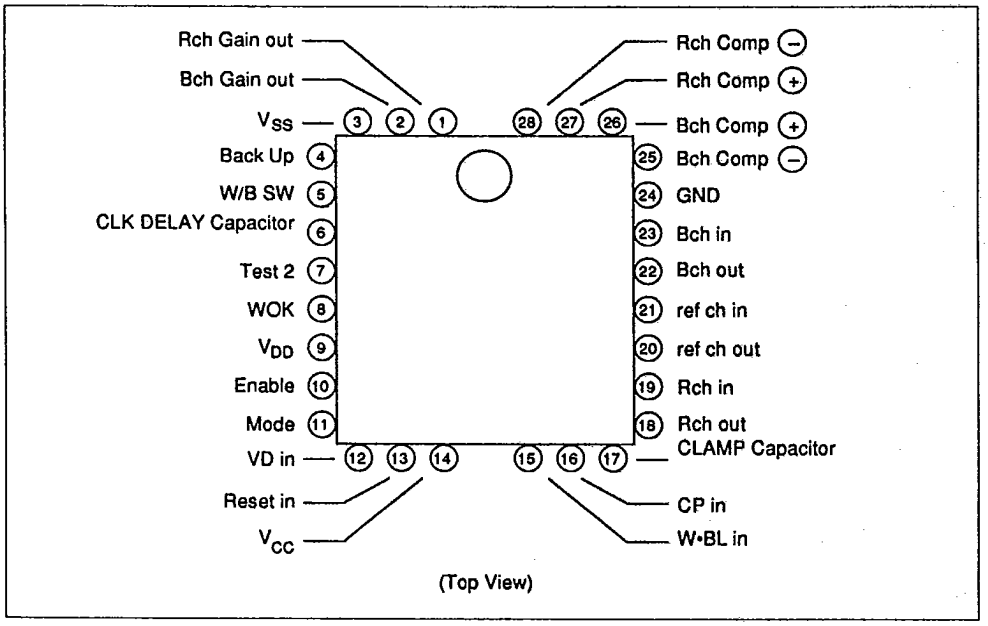
Features

- Fully automatic, one-touch white balance adjustment on a single chip
- 6-bit gain control output resolution
- Enable terminal allows termination of white balance operation
- CMOS in logic section allows counter backup using capacitors

Ordering Information

Type No.	Package
HA11899MP	MP-28

Pin Arrangement



(Top View)

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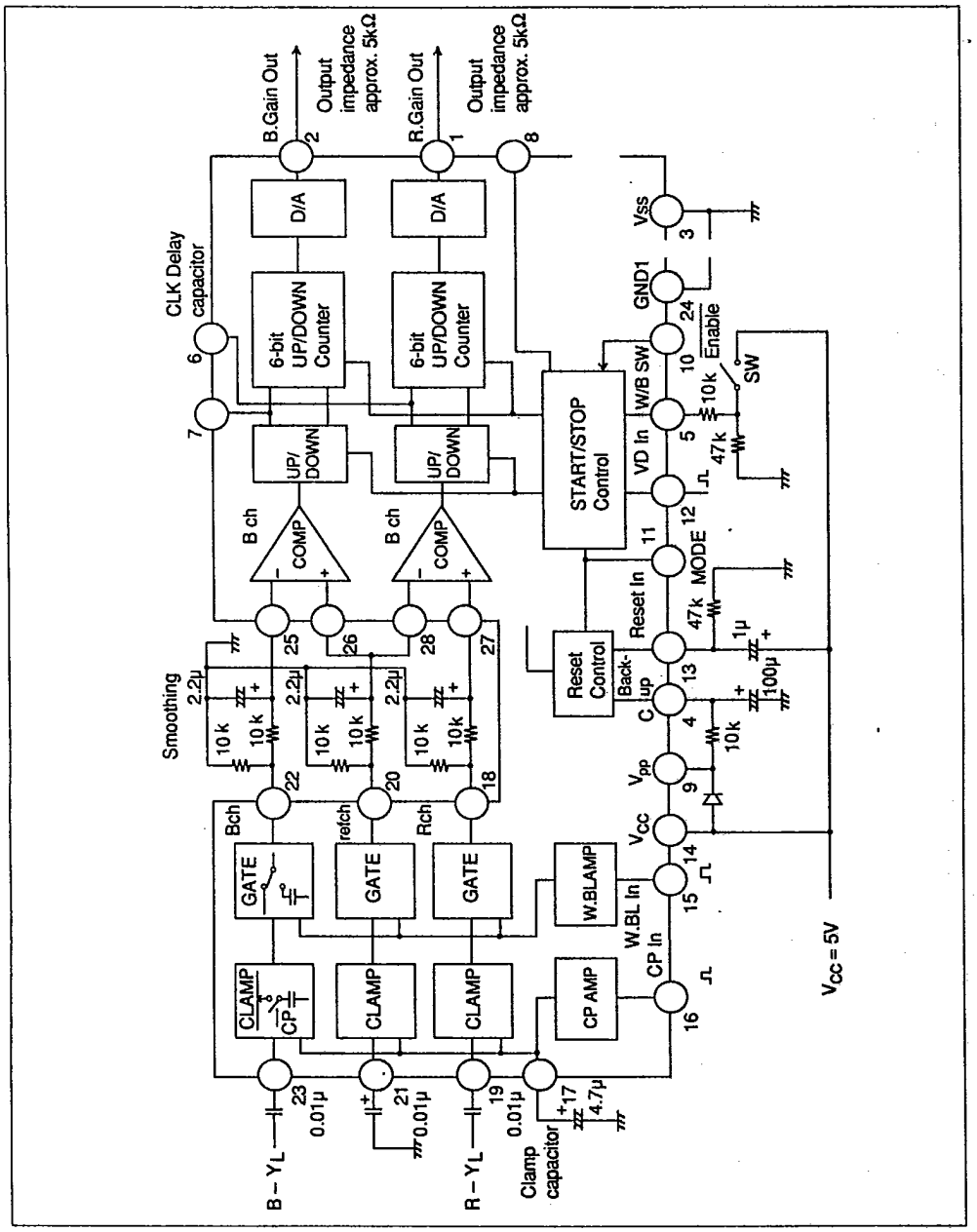
Block Diagram



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Pin Descriptions

Pin No.	Function	I/O	DC Voltage (V)	Operating Waveform	Input/output Impedance	Remarks
1	R ch Gain out	O	0 to 4.65	DC	DAC output	Reset at 2.3V (R_L = 39kΩ)
2	B ch Gain out	O	0 to 4.65	DC	DAC output	Reset at 2.3V (R_L = 39kΩ)
3	V_{SS}		0			
4	Back up	I	4.3		C-MOS input	
5	W/B SW	I	3.2 1.2	DC	C-MOS input	
6	Condenser	O	2.9 1.2		C-MOS input	470pF
7	TEST	O	4.1 1.0		C-MOS input	B ch TEST terminal
8	WOK	O	4.1 1.0		C-MOS input	Set : H when W/B is OK Full Auto : L for overflow only
9	V_{DD}		4.3	DC		C-MOS power supply
10	Enable	I	2.9 1.2	DC	C-MOS input	
11	MODE	I	2.9 1.2	DC	C-MOS input	Set/Full Auto switching
12	V_D in	I	1.5 0.3		10kΩ	60Hz rectangular waveform
13	Reset in	I	1.5 0.3	DC	10kΩ	
14	V_{CC}		5	DC		Bi-polar power supply
15	W•BL in	I	2.3 1.3		Base input	
16	CP in	I	2.3 1.3		Base input	
17	Clamp capacitor	I	2.5	DC	Emitter output	
18	R ch signal out	O	2.52		Emitter output	When clamp
19	R ch signal in	I	2.5		Base input	When clamp
20	ref ch signal out	O	2.52		Emitter output	When clamp
21	ref ch signal in	I	2.5		Base input	When clamp
22	B ch signal out	O	2.52		Emitter output	When clamp
23	B ch signal in	I	2.5		Base input	When clamp
24	GND		–			
25	B ch Comp –	I	4.1 2.3		Base input	
26	B ch Comp +	I	4.1 2.3		Base input	
27	R ch Comp +	I	4.1 2.3		Base input	
28	R ch Comp –	I	4.1 2.3		Base input	

* DC voltage
At upper value or above = high
At lower value or below = low

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Absolute Maximum Ratings (Ta = 25°C)

Item	Symbol	Rating	Unit
Supply Voltage	V_{CC}, V_{DD}	7	V
Power Dissipation	P_T*1	350	mW
Operating Temperature	T_{opr}	−10 to +75	°C
Storage Temperature	T_{stg}	−55 to +125	°C
Operating Supply Voltage 1	V_{CC}*2	5.0±0.25	V
Operating Supply Voltage 2	V_{DD}*3	−0.25 to 4.3+0.95	V

Notes: *1: Value at Ta = 75°C

*2: Bipolar block

*3: CMOS block

Electrical Characteristics (V_{CC} = 5V, V_{DD} = 4.3V, Ta = 25°C)

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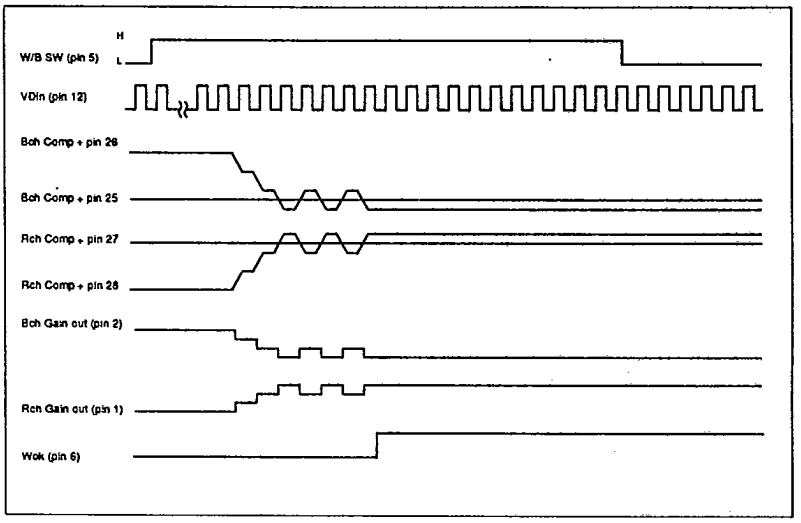
Item		Symbol	Min	Typ	Max	Unit	Applicable Terminal	Test Condition
Supply Current		I_{CC}	4.2	6.0	9.0	mA	14	
		I_{DD}	–	–	0.5	mA	9	
Input Level	Clamp Input	V_{IH1}	2.3	–	5.0	V	16	
		V_{IL1}	–	–	1.3	V		
	W•BL Input	V_{IH2}	2.3	–	5.0	V	15	
		V_{IL2}	–	–	1.3	V		
	VD Input	V_{IH3}	1.5	–	5.0	V	12	
		V_{IL3}	–	–	0.3	V		
	Reset Input	V_{IH4}	1.5	–	5.0	V	13	
		V_{IL4}	–	–	0.3	V		
	W/B Input	V_{IH5}	2.9	–	4.3	V	5	
		V_{IL5}	–	–	1.2	V		
	$\overline{\text{Enable}}$ Input	V_{IH6}	2.9	–	4.3	V	10	
		V_{IL6}	–	–	1.2	V		
	MODE Input	V_{IH7}	2.9	–	4.3	V	11	
		V_{IL7}	–	–	1.2	V		
Comparator Input Minimum Comparative Electrical Differential		$\triangle V_{IC}$	–	–	6.0	mV	25, 26, 27, 28	
WOK Output Drive Current		I_{OH1}	1.0	–	–	mA	8	
		I_{OL2}	–	–	–1.0	mA		
DAC Output Voltage Precision		V_{GOR}	10	78	120	mV/step	1, 2	
DAC Output Maximum Voltage		V_{Dmax}	4.35	4.47	4.65	V	1, 2	R_L=39kΩ
DAC Output Minimum Voltage		V_{Dmin}	–	–	0.05	V		
DAC Output Voltage at Reset		V_{DR}	2.05	2.30	2.57	V		
Clamp Output Voltage		V_{CP}	2.37	2.60	2.97	V	18, 20, 22	
Clamp Output Voltage Channel-to-channel Difference		$\triangle V_{CP}$	–	0	7.0	mV		
Gate Output Voltage		V_G	2.20	2.35	2.80	V		
Gate Output Voltage Channel-to-channel Difference		$\triangle V_G$	–	0	7.0	mV		
Backup Current		I_{BU}	–	–	30	nA	4, 5	
Minimum Backup Voltage		V_{BUmax}	–	–	3.2	V	4	

Timing Charts

1. White balance basic operation (set)

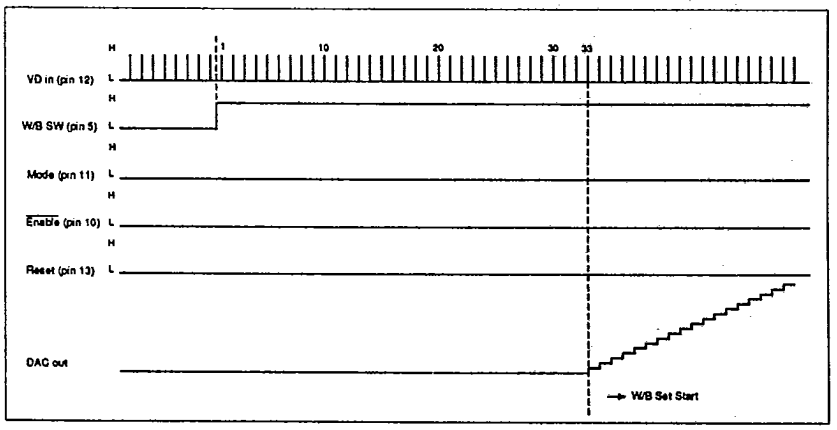


Notes:

1. Starts at the 33rd VD pulse after W/B switch goes high.
2. In full auto, neither pin 1 nor pin 2 is latched, and W/B is automatically tracked corresponding to the object being taped.

2. Start timing (W/B set mode)

2-a W/BSW Start



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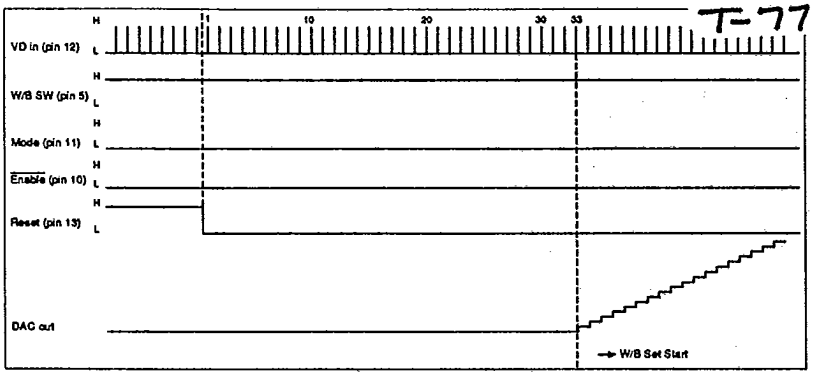
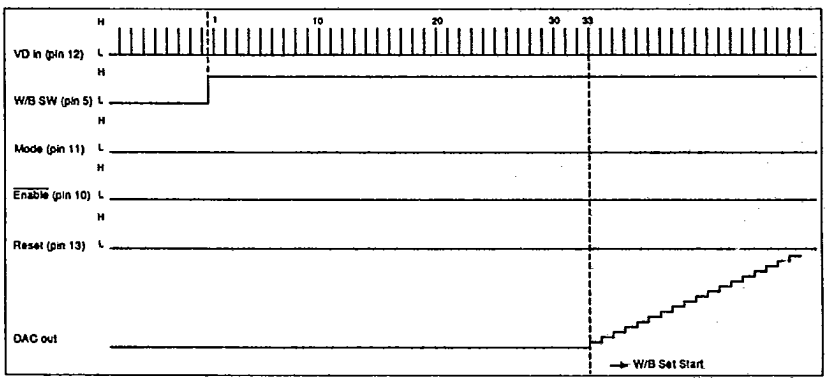
2-b Reset Start

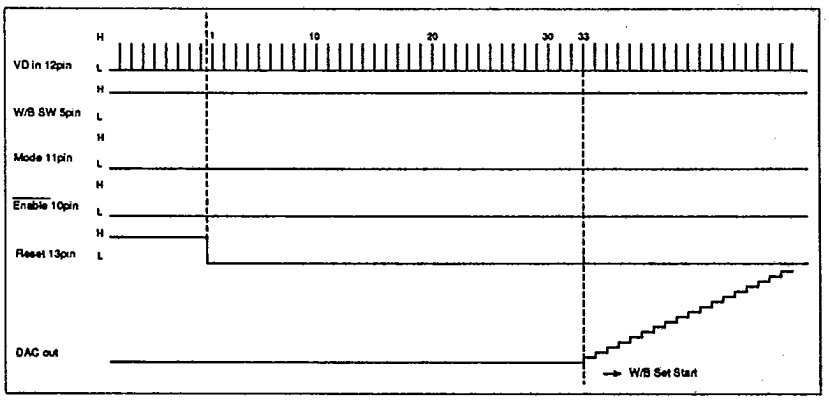


3. Start timing (full auto mode)

3-a W/B SW Start

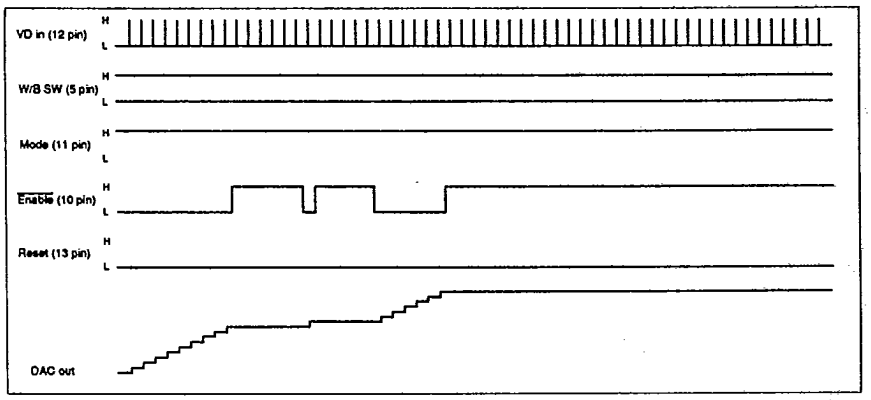


3-b Reset Start

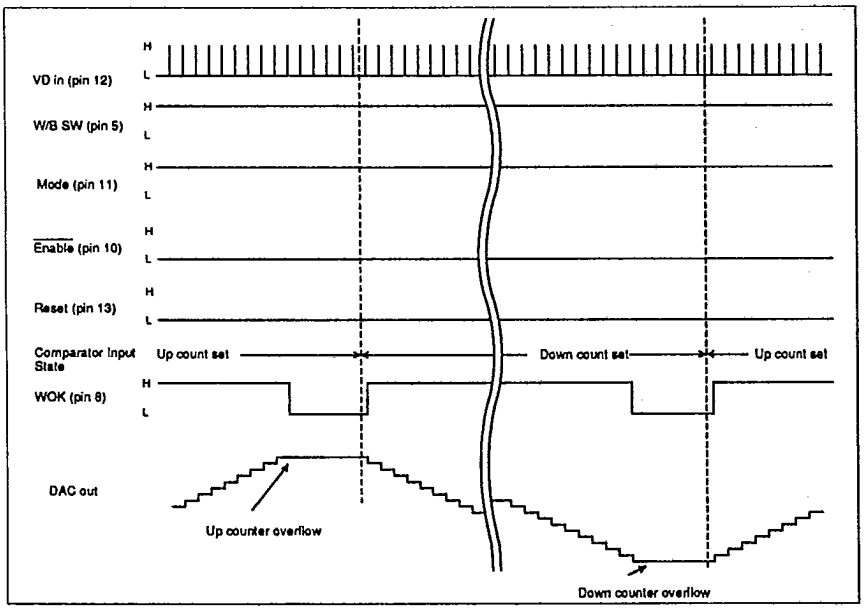


Notes:
DAC out indicates R ch (pin 1) and B ch (pin 2) gain out.
Timing chart indicates setting when comparator input setting is counted up.

4. Enable function of the full auto start mode



5. Timing chart for overflow (full auto mode)



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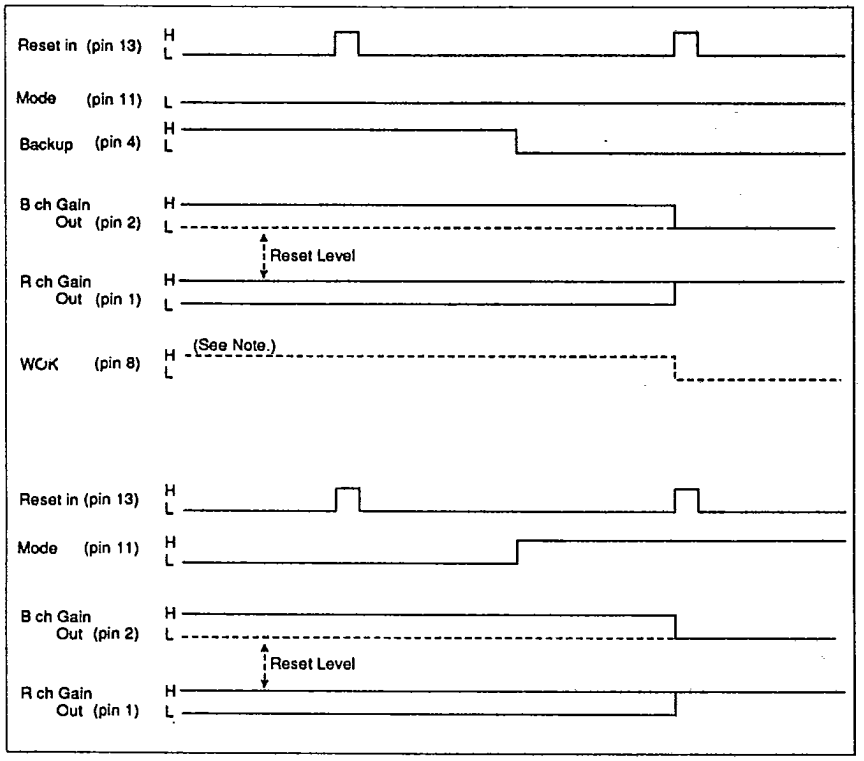
6. Initialize set



Note:

The time chart showing WOK indicates white balance complete, prior to receiving reset.