

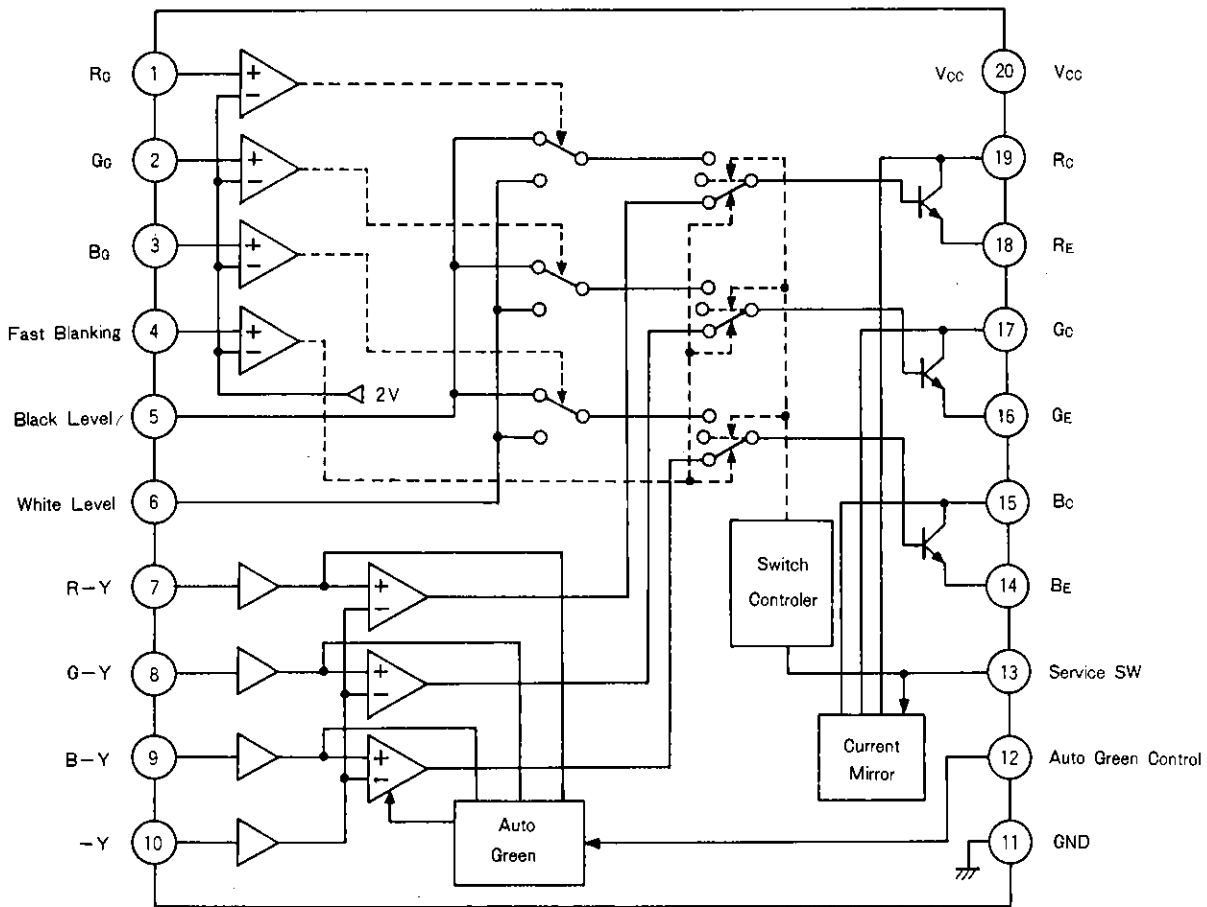


LA7696

Operating Characteristics at Ta = 25°C, V <sub>CC</sub> = V <sub>20</sub> = 12V *C = R, G, B				min	typ	max	unit
Output Breakdown Voltage	BV <sub>CEO</sub>	I <sub>C</sub> = 0.1mA, I <sub>B</sub> = 0 (V <sub>13</sub> = 5.0V)	16				V
Supply Current	I <sub>CC20</sub>		27	35	44		mA
Output DC Voltage	V <sub>EC</sub>	-Y = 4.0Vdc, C-Y = 5.2Vdc Pin13 : open	4.5	5.0	5.5		V
Output DC Differential Voltage	ΔV <sub>EC</sub>		-0.2	0	+0.2		V
Service Current	I <sub>C FACT</sub>	V <sub>13</sub> = 5.0V			0.1		mA
	I <sub>C Field</sub>	Pin 13 : Pulled up to V <sub>CC</sub> with 2.2kΩ	2.5	2.7	2.9		mA
Graphics Black Level	V <sub>BLC</sub>	V <sub>BL</sub> = 4.3Vdc, CG = 0V, FB = 5V	4.5	5.0	5.5		V
Graphics White Level	V <sub>WLC</sub>	V <sub>WL</sub> = 5.4Vdc, CG = FB = 5V	5.5	6.0	6.5		V
Gain	G	C-Y = 5.2Vdc, -Y = 3.5Vdc, 1Vp-p, f = 1kHz	0.90	0.95	1.00		
Frequency Characteristics	f-3dB	C-Y = 5.2Vdc, -Y = 3.5Vdc, 1Vp-p	8.0	14.0			MHz
Output Voltage at OFF Mode	V <sub>R,G,B</sub>	C-Y = 5.2Vdc, -Y = 5.0Vdc	4.4	4.5	4.6		V
-Y Distortion Factor	-Y <sub>Dist</sub>	-Y = 3.5Vdc, 1Vp-p, 1kHz C-Y = 5.2Vdc			1		%
C-Y Distortion Factor	C-Y <sub>Dist</sub>	C-Y = 5.2Vdc, 1Vp-p, 1kHz -Y = 3.5Vdc			1		%
CG&FB Pulse Width	P <sub>W CGFB</sub>	FB = CG = 5Vp-o, 250ns, -Y = 4.5Vdc, V <sub>WL</sub> = 5.9Vdc, C-Y = 5.2Vdc	205	255	305		ns
CG&FB Delay Time	T <sub>d CGFB</sub>	"		68	100		ns
FB Pulse Width	P <sub>W FB</sub>	FB = 5Vp-o, 250ns, -Y = 2.5Vdc, V <sub>BL</sub> = 4.3Vdc, C-Y = 5.2Vdc	215	265	315		ns
FB Pulse Width Error	ΔP <sub>W FB</sub>	"	-25	0	+25		ns
FB Delay Time	T <sub>d FB</sub>	"		57	100		ns
CG Pulse Width	P <sub>W CG</sub>	FB = 5Vdc, CG = 5Vp-o, 250ns V <sub>WL</sub> = 5.9Vdc, V <sub>BL</sub> = 3.8Vdc	215	265	315		ns
CG Pulse Width Error	ΔP <sub>W CG</sub>	"	-25	0	+25		ns
CG Delay Time	T <sub>d CG</sub>	"		65	100		ns
Maximum Auto-Green	AG max	R-Y = B-Y = 5.2Vdc, G-Y = 6.2Vdc -Y = 2.0Vdc, V <sub>12</sub> = 0 → 12V	1.9	2.3	2.7		V
Middle Auto-Green	AG mid	R-Y = B-Y = 5.2Vdc, G-Y = 6.2Vdc -Y = 2.0Vdc, V <sub>12</sub> = 0 → 8V	0.9	1.1	1.3		V
Input "H"-Level Voltage	V <sub>IH</sub>	C-Y = 5.2Vdc, -Y = 4.0Vdc V <sub>BL</sub> = 5.4V, V <sub>WL</sub> = 5.9V	2.3				V
Input "L"-Level Voltage	V <sub>IL</sub>	C-Y = 5.2Vdc, -Y = 4.0Vdc V <sub>BL</sub> = 5.4V, V <sub>WL</sub> = 5.9V			0.8		V
V <sub>CC</sub> Dependence of Output DC Voltage	ΔV <sub>out</sub>	-Y = 4.0Vdc, C-Y = 5.2Vdc (V <sub>CC</sub> = 12V)	4.4	9.4	14.4		%/V

Note) Be sure to connect a protection resistor to pins 15, 17, 19 to prevent the IC from breaking down when discharge occurs in the cathode-ray tube.

**Block Diagram**



**Auto Green Function  
Basic Operation**

When a standard NTSC demodulator is used to demodulate green color, an original green color turns bluish green. The auto green function works to reduce the B-Y component for green color correction so that the original green color can be reproduced faithfully. This correction can be provided in the range shown in Fig.1.

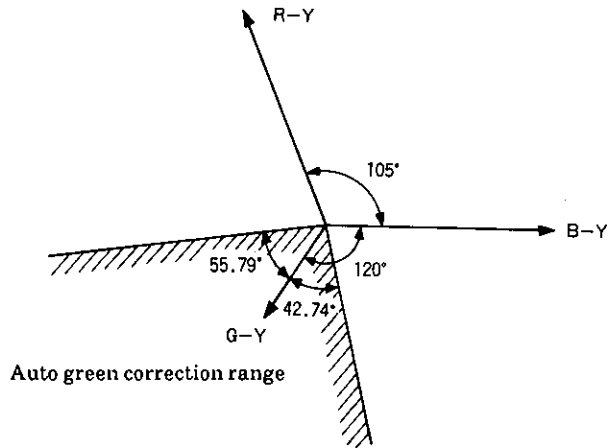


Fig.1 Auto Green Correction Range

The auto green function compares each color difference signal of  $R-Y$ ,  $G-Y$ ,  $B-Y$  and if the  $G-Y$  component is larger than the  $R-Y$ ,  $B-Y$  components the  $B-Y$  component is reduced in proportion to the difference between them.

The auto green function is also capable of providing your desired correction by setting the control voltage on pin 12. When the control voltage on pin 12 is changed as  $0V \rightarrow 12V$ , the input signals are changed equivalently as shown in Example 1. Actually, 5.2V offset given to  $R-Y$ ,  $G-Y$ ,  $B-Y$  with  $-Y = 4V$  causes the B output (pin 14 of LA7696) to change as  $4.83V \rightarrow 4.64V$ .

**Example 1**  
Control voltage on pin12

$$\begin{array}{ccc}
 & 0\text{V} \xrightarrow{\hspace{2cm}} 12\text{V} & \\
 \left( \begin{array}{l} R-Y = -0.212\text{V} \\ G-Y = +0.100\text{V} \\ B-Y = -0.167\text{V} \end{array} \right. & \begin{array}{c} \text{Changed} \\ \text{equivalently} \end{array} & \left( \begin{array}{l} R-Y = -0.212\text{V} \\ G-Y = +0.100\text{V} \\ B-Y = -0.358\text{V} \end{array} \right. \\
 \text{min} & & \text{max}
 \end{array}$$

If the G-Y component is +0.1V when a color on the G-Y demodulation axis comes, the B output voltage changes with the control voltage on pin 12 as shown in Fig.2. The maximum change is -0.19V.

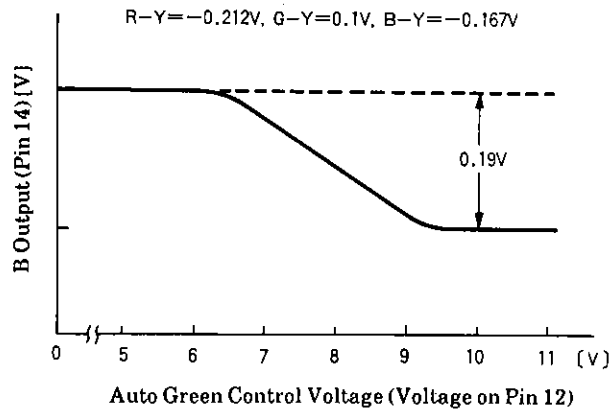


Fig.2. Auto Green Characteristic

**Function of the Service Switch**

(screen grid voltage adjustment function during white balance adjustment)

The LA7679 output can be switched between the three modes a, b and c described below by the state of pin 13.

**a) Service switch function (for adjustment by a serviceman in the field)**

This function is provided to allow the screen grid voltage to be adjusted easily during white balance adjustment.

As shown in Figure 3, when pin 13 is connected to  $V_{CC}$  through the resistor R13, the pin 15, 17 and 19 output transistors will be off. At the same time, a current equivalent to the current ( $I_{13}$ ) flowing in resistor R13 flows into each of the pins 15, 17 and 19. As a result, the CRT cathode potential can be fixed at an arbitrary value by changing R13. Thus the screen grid voltage can be adjusted easily.

The current flowing into pins 15, 17 and 19 is determined by the following formula.

$$I_{15} = I_{17} = I_{19} = I_{13} = \frac{V_{CC}}{2 \times R13}$$

Since pin 13 is connected to  $V_{CC}$  through a 2.2k $\Omega$  resistor, a current of about 2.7mA flows into each pin 15, 17 and 19. If + High B is set to 200V, the CRT cathode is fixed at 160V. The purpose of Tr1 is to protect the IC.

**b) Service switch function (for adjustment at the factory)**

The pin 15, 17 and 19 currents can be set to 0 ( $I_{15} = I_{17} = I_{19} = 0$ ) by applying 5V (when  $V_{CC} = 12\text{V}$ ) to pin 13. In this state the pin 15, 17 and 19 output transistors will be off. Fix the CRT cathode potential by connecting a constant current source to the points (a total of 3 points) indicated with stars in Figure 3, and then adjust the screen grid voltage.

This mode is appropriate for use in the manufacturing process where the TV set is assembled.

**c) Normal operation**

When pin 13 is left open, the video signal will be output from pins 15, 17 and 19.



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