

HA11580

COLOR TV CHROMA SYSTEM

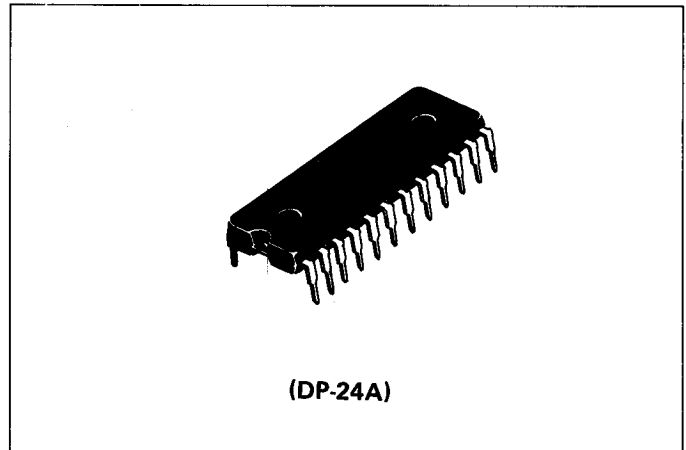
HA11580 is a monolithic silicon integrated circuit which constitutes a complete chroma processing system for color television receivers.

HA11580 consists of band-pass amplifier, color sync and color demodulator and designed to minimize number of external components.

Demodulation angles and relative gains are optional with set designers by choosing external components values.

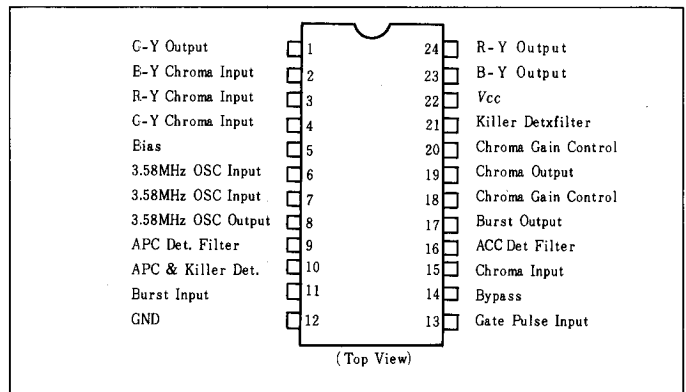
■ FEATURES

- Band-pass amplifier
 - Peak detection type ACC detector
 - ACC & killer adjustments are unnecessary
 - DC color control
- Color sync
 - APC type subcarrier regenerator
 - Transformerless VCO
- Color demodulator
 - 3 axes demodulation
 - Regenerated subcarrier are let from color sync in the IC

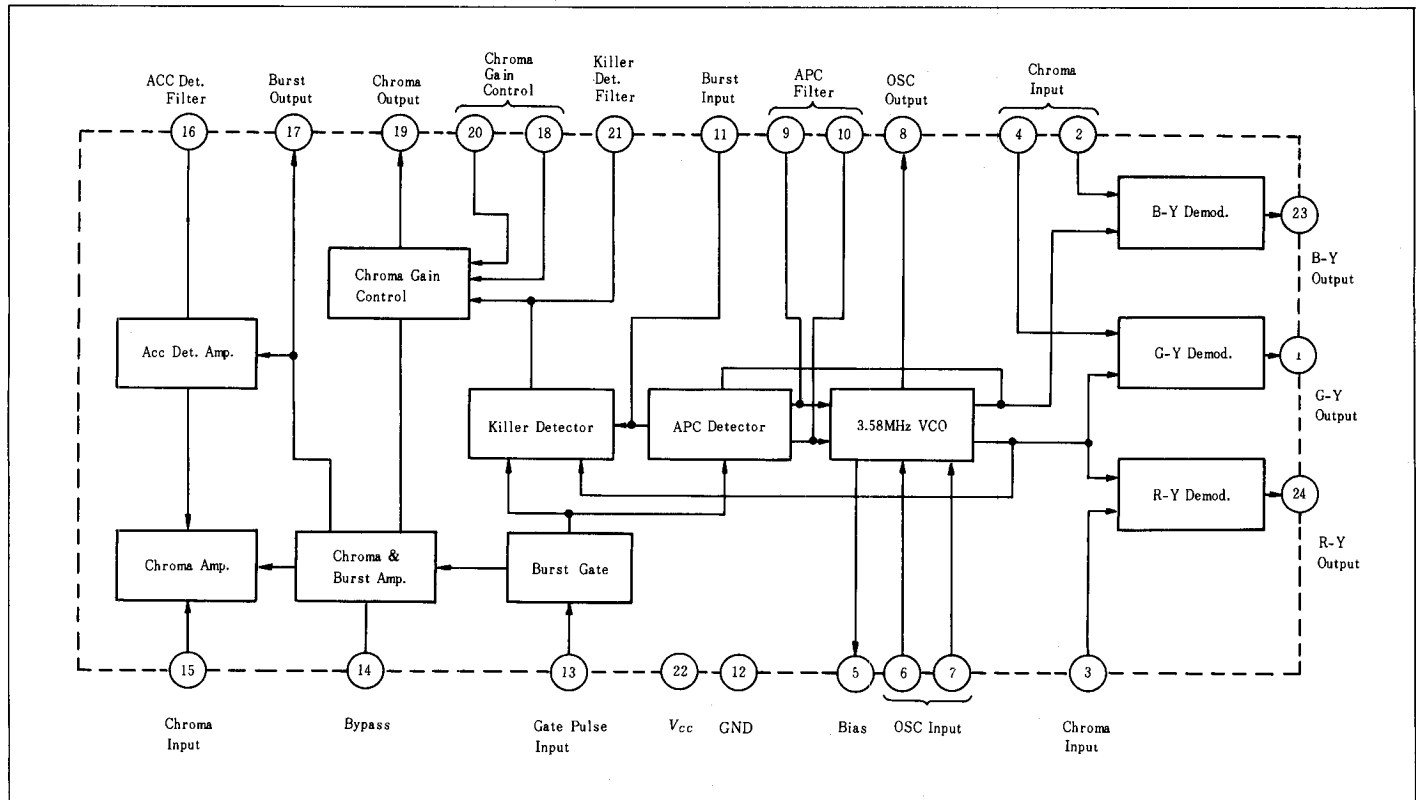


(DP-24A)

■ PIN ARRANGEMENT



■ BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATINGS

Item	Symbol	Rating	Unit
Supply Voltage (Positive)	V_{CC}	15	V
Power Dissipation	P_T^*	600	mW
Operating Temperature	T_{opr}	-20 to +85	°C
Storage Temperature	T_{stg}	-55 to +125	°C

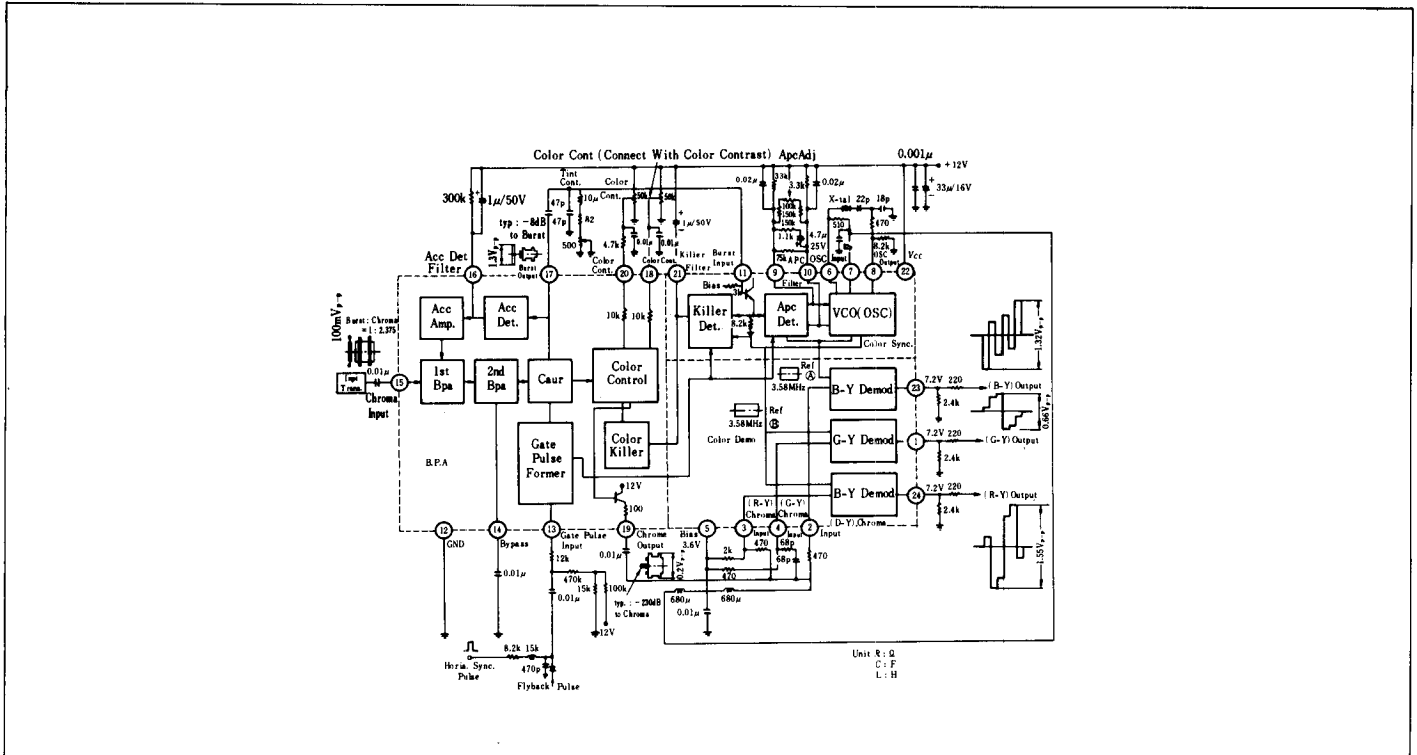
* Value at $T_a=60^\circ\text{C}$

■ ELECTRICAL CHARACTERISTICS ($T_a=25^\circ\text{C}$)

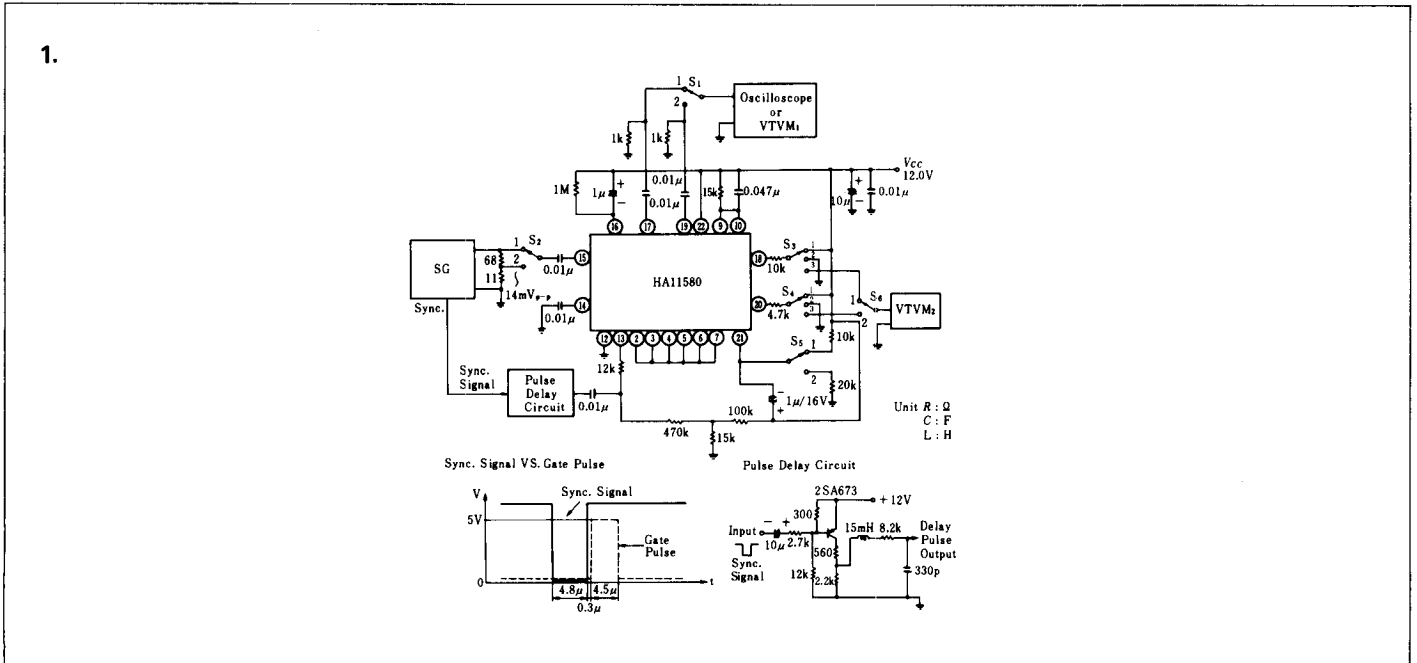
Item	Symbol	Test Circuit	Test Condition	min	typ	max	Unit
Supply Current	I_{CC}	4	Average value of total current at color reception	29	36	48	mA
Maximum Chroma Output	e_{cmax}	1		—	0.71	—	Vp-p
Burst Output	e_b	1		1.0	1.3	1.7	Vp-p
ACC Range	e_a	1		0.7	—	—	Vp-p
Residual Color (by color killer)	e_k	1		—	—	1	mVrms
Residual Color (by color control)	e_r	1		—	—	1	mVrms
Terminal Voltage of pin 18	V_{18}	1	pin 18 open	6.9	7.2	7.5	V
Terminal Voltage of pin 20	V_{20}	1	pin 20 open	—	6.2	—	V
Differential Voltage of APC Detector Output	V_p	2		-50	0	+50	mV
APC Pull-in Range	f_p	2	Burst-signal amplitude = 0.65Vp-p	± 240	± 375	—	Hz
Frequency Control Sensitivity (VCO)	β	2		—	1.0	—	Hz/mV
Phase Detector Sensitivity	μ	2		—	25	—	Hz/deg
Frequency Stability	f_{ov}	2	$V_{CC}=12\pm 1\text{V}$	-20	0	+20	Hz
Killer Current	Color	I_{kc}	Burst signal amplitude = 0.65Vp-p	30	65	—	μA
	B & W	I_{kb}		5	15	35	μA
Temperature Stability of APC detector	ΔV_{PT}	2	$T_a=25\pm 35^\circ\text{C}$	-70	0	+70	mV
Color Demod. Output DC Voltage	$E_{0(DC)}$	3		6.6	7.2	7.8	V
Temperature Coefficient of Output DC Voltage	$\frac{\delta E_{0(DC)}}{\delta T}$	3		—	0	—	mV/°C
Differential Output Voltage	$\Delta E_{0(DC)}$	3		-0.3	0	+0.3	V
Temperature Coefficient of Output Voltage	$\frac{\delta \Delta E_{0(DC)}}{\delta T}$	3		—	0	—	mV/°C
Chroma Output	e_{01}	3	ACC OFF at input chroma signal amplitude 0.2Vp-p	—	1.95	—	Vp-p
Color Demod. Maximum Output Voltage	e_{0max}	3	ACC OFF at input chroma signal amplitude 1.2Vp-p	4.5	5.5	—	Vp-p
Residual Carrier	e_{cor}	3	3.6MHz component	—	—	0.2	Vp-p
Residual Harmonic	e_{ham}	3		—	—	2.2	Vp-p
Overall Color Difference Output	e_{02}	4	ACC ON	1.23	1.95	3.10	Vp-p

HA11580

FUNCTIONAL BLOCK DIAGRAM



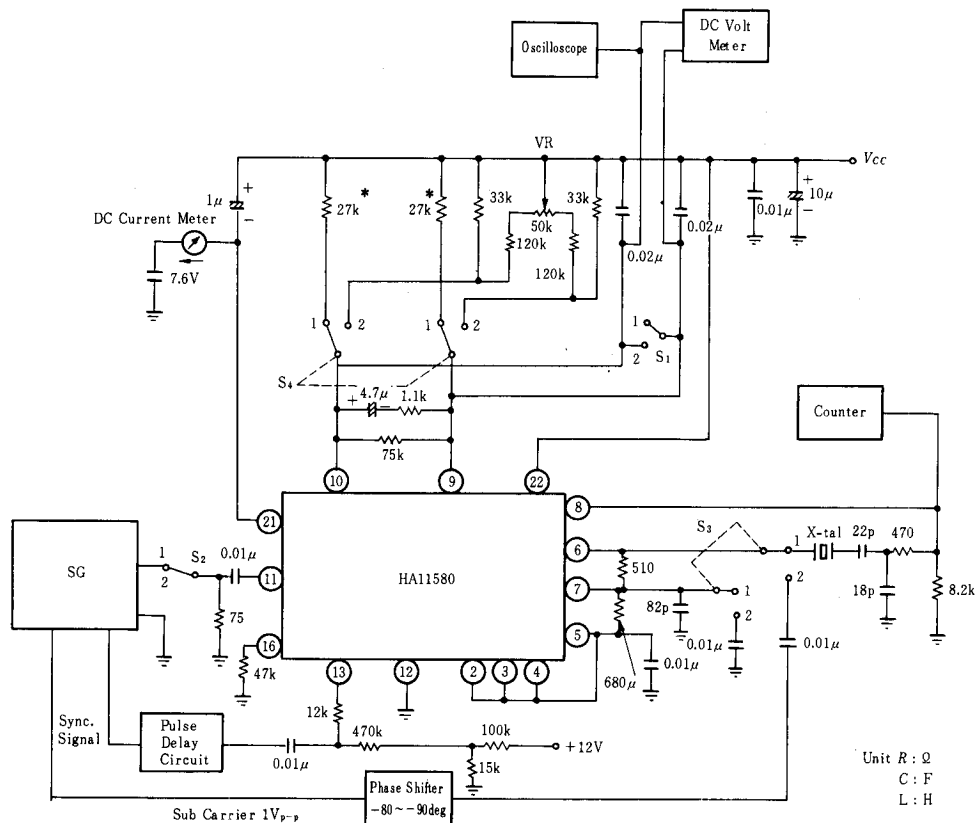
TEST CIRCUIT



TEST PROCEDURE

Symbol	Switch Position						Oscilloscope or VTVM
	S ₁	S ₂	S ₃	S ₄	S ₅	S ₆	
e _c max	1	2	1	1	2	—	Oscilloscope
e _b	1	1	1	1	2	—	Oscilloscope
e _a	2	1	1	1	2	—	Oscilloscope
e _o	1	2	1	1	1	—	VTVM ₁
e _r	1	2	1	2	2	—	VTVM ₁
V ₁₈	1	2	3	1	1	1	VTVM ₂
V ₂₀	1	2	1	3	1	2	VTVM ₂

2.

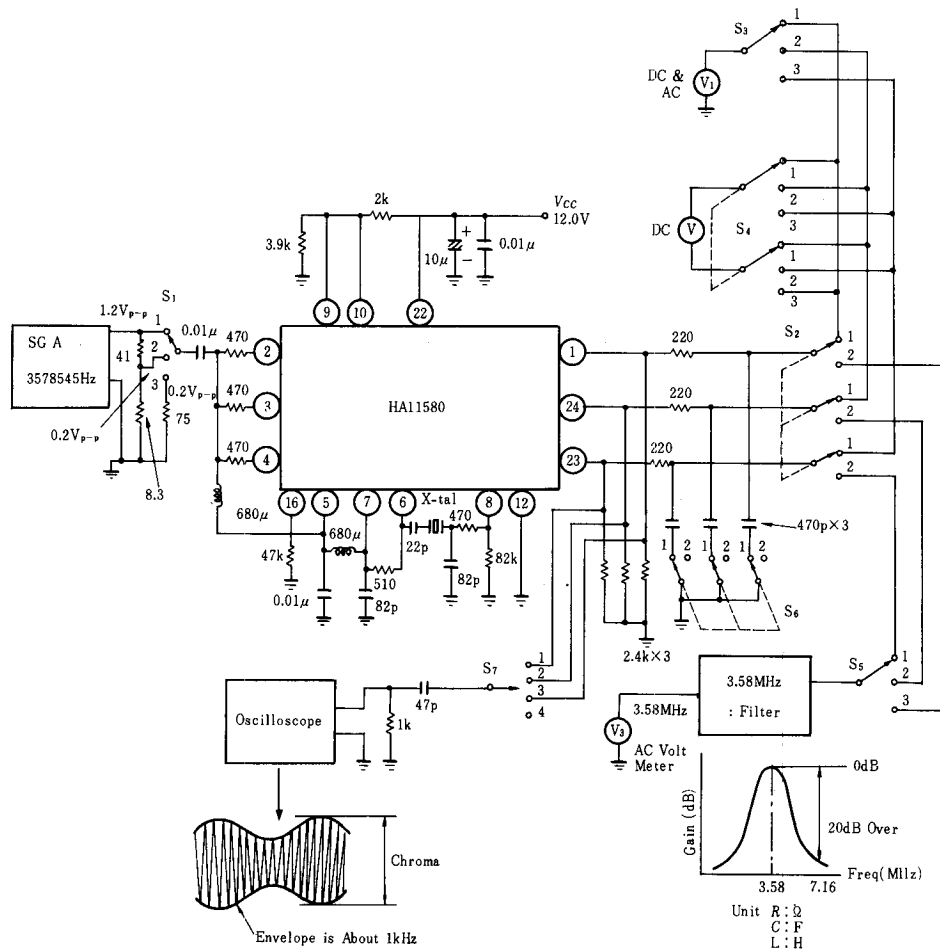


- Note: 1. SG: Burst Signal Generator (Shiba-Soku Co. 397A),
 $V_{out} = 0.65V_{p-p}$, Burst 10 cycles
 2. X-tal: Crystal Oscillator (TEW 280561)
 3. *: Accuracy $\pm 0.3\%$

■ TEST PROCEDURE

Symbol	Switch Position				Test Condition
	S ₁	S ₂	S ₃	S ₄	
V _p	1	2	1	1	DC Volt. Meter
f _p	1	2	1	2	Adjust VR for $f_{osc} = 3,579,545Hz \pm 10Hz$
	1	1	1	2	Change frequency of burst signal generator. Measure and record the pull-in range
β	1	1	1	1	Change into 3,579,595Hz from 3,579,495Hz burst signal frequency. Measure the variation of DC volt. meter. Calculate controled sensitivity. $\beta = 100/\text{variation of DC volt. meter}$
μ	1	1	2	1	Fix burst frequency for $3,579,545Hz \pm 10Hz$. Turn phase shift to -80 deg. from -90 deg. Measure and record the DC volt. meter. Calculate the detection sensitivity. $\mu = \text{variation of DC volt. meter}/10$
f _{OV}	1	2	1	1	Change V _{cc} for $12 \pm 1.0V$. Measure and record the counter.
I _{KC}	1	1	1	1	Measure and record the DC current meter. Test value is negative direction.
I _{Ka}	1	2	1	1	Measure and record the DC current meter. Test value is positive direction.
ΔV_{PT}	1	1	2	1	Measure and record the DC volt. meter at $T_a = 25 \pm 35^\circ C$

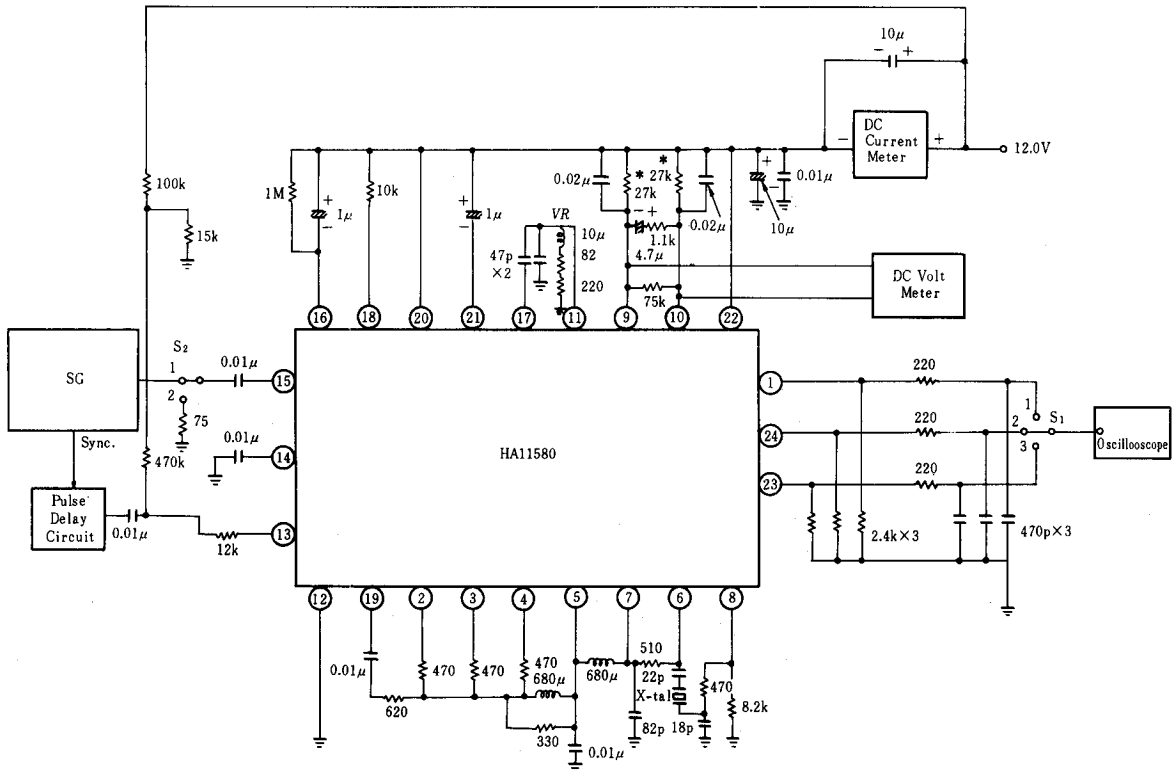
3.



■ TEST PROCEDURE

Symbol	Switch Position							Test Condition
	S ₁	S ₂	S ₃	S ₄	S ₅	S ₆	S ₇	
$E_{0(DC)}$	3	1	Each Position	—	—	1	4	Measure and record DC voltage
$\delta E_{0(DC)} / \delta T$								$T_a = -20 \text{ to } +75^\circ\text{C}$
$\Delta E_{0(DC)}$	3	1	—	Each Position	—	1	4	Measure and record DC voltage
$\delta \Delta E_{0(DC)} / \delta T$								$T_a = 20 \text{ to } +75^\circ\text{C}$
e_{01}	2	1	Each Position	—	—	1	4	Measure 1kHz beat signal at $V_{in} = 0.2V_{p-p}$
e_{0max}	1							Measure 1kHz beat signal at $V_{in} = 1.2V_{p-p}$
e_{car}	3	2	—	—	Each Position	2	4	Measure 3.6MHz component
e_{harm}	1	2	—	—	—	1	1, 2, 3	Measure e_{harm} for synchroscope

4.

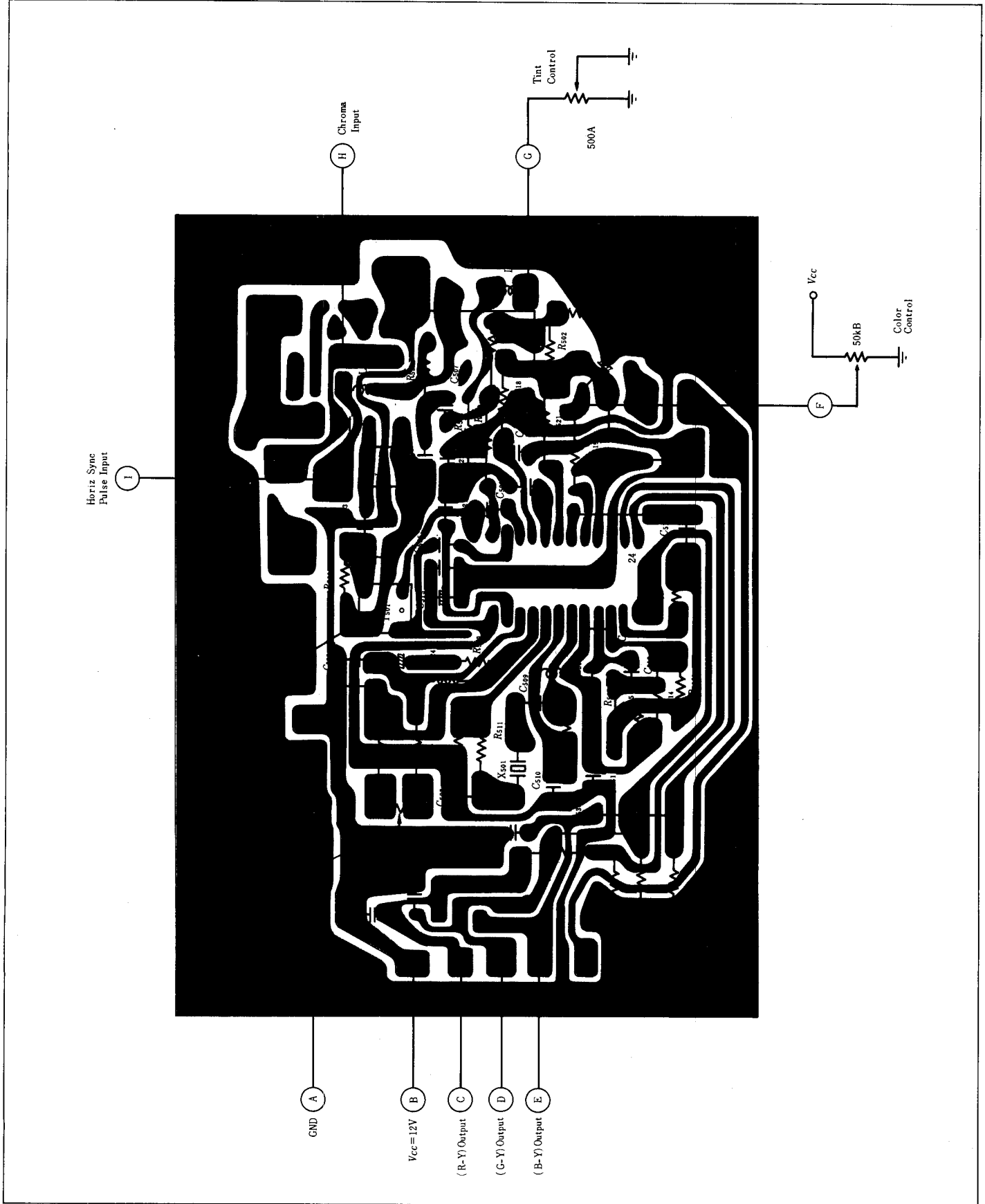


- Notes 1. SG: Rainbow Color Bar Generator (Shiba-Soku Co. TG-5),
V_{out} = 100mVp-p.
- 2. X-tal: Crystal Oscillator (TEW 280561)
- 3. *: Accuracy ±0.3%

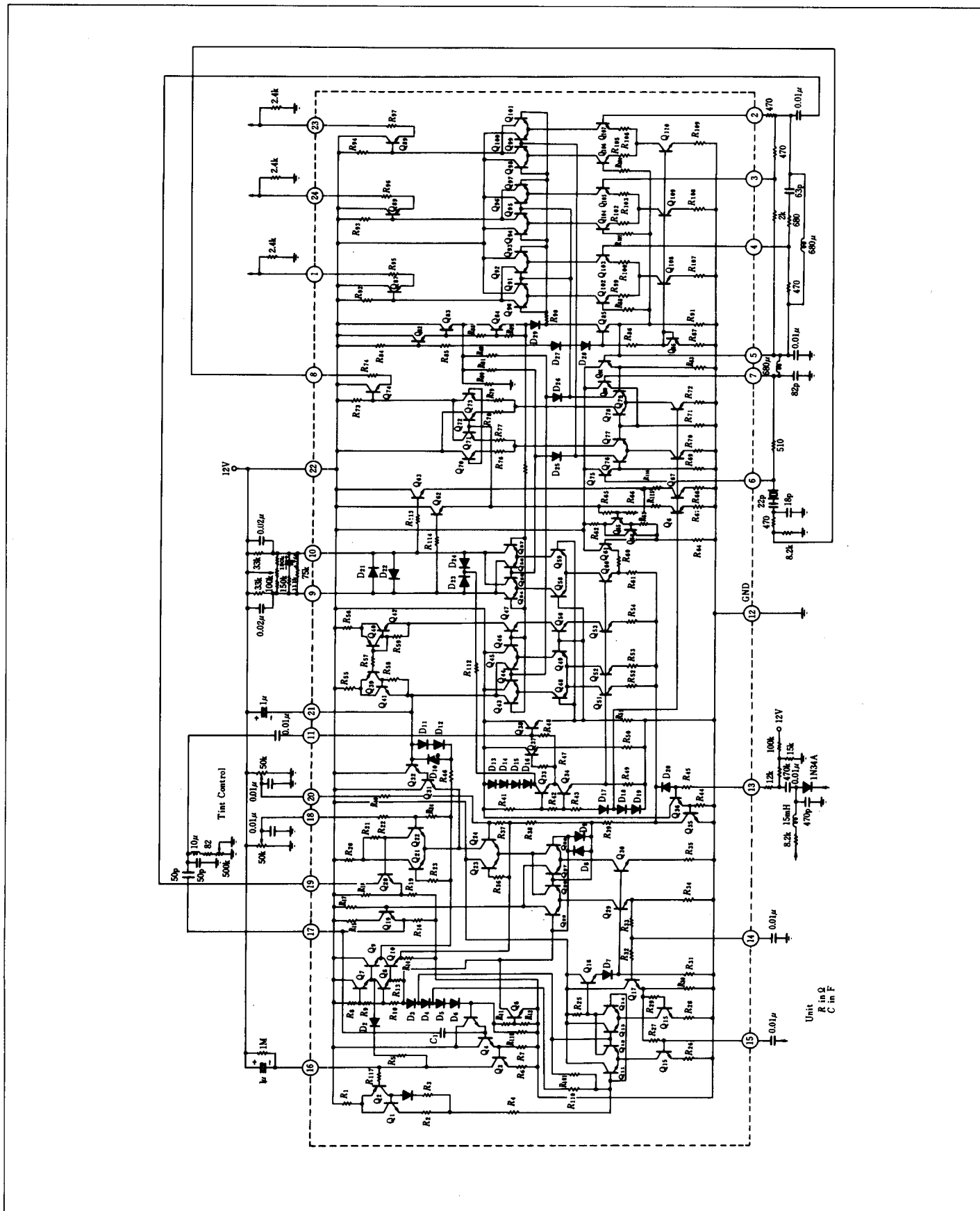
■ TEST PROCEDURE

Symbol	Switch Position		Test Condition
	S ₁	S ₂	
e ₀₂	Each Position	1	Measure and record synchroscope at ACC-ON
I _T	—	1	Measure and record DC current meter

■ P.C. BOARD LAYOUT (Bottom View)



■ CIRCUIT SCHEMATIC AND TYPICAL EXTERNAL COMPONENTS



APPLICATION EXAMPLE

