

# AN5315, AN5316N

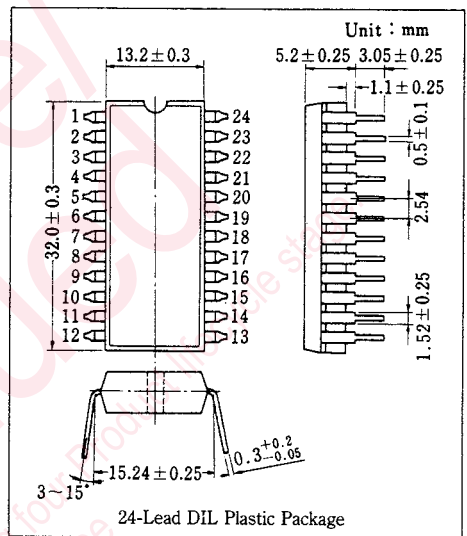
## Color TV Video and Chrominance Signal Processing Circuits

### ■ Outline

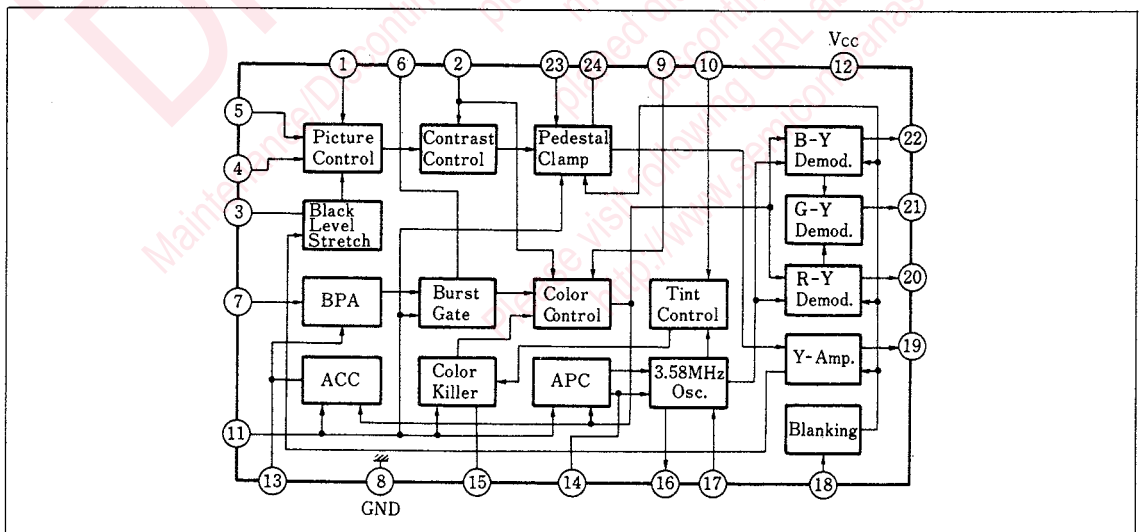
The AN5315 and The AN5316N are integrated circuits designed for all color TV video and chrominance signal processing circuits.

### ■ Features

- The AN5315 and AN5316N provide total video and chrominance signal processing circuitry, allow compact set design
- Output signals provide R-Y, G-Y and B-Y color difference output and luminance output
- All DC control system for simplicity of wiring (color, tint, contrast picture, luminance)
- DC transfer  
AN5315...76%, AN5316N...87%



### ■ Block Diagram



### ■ Absolute Maximum Ratings ( $T_a=25^\circ\text{C}$ )

Item	Symbol	Rating	Unit	
Voltage	Supply Voltage	$V_{CC}$	14.4	V
	Circuit Voltage	$V_{12-8}$	0 14.4	V
		$V_{1, 2, 9, 10, 18, 23-8}$	0 $V_{12-8}$	V
		$V_{11}$	-5 $V_{12-8}$	V
Circuit Current	$I_{19}$	-20 5	mA	
	$I_{20, 21, 22}$	-40 -	mA	
Power Dissipation ( $T_a=70^\circ\text{C}$ )	$P_D$	1020	mW	
Temperature	Operating Ambient Temperature	$T_{opr}$	-20~+70	$^\circ\text{C}$
	Storage Temperature	$T_{stg}$	-55~+150	$^\circ\text{C}$

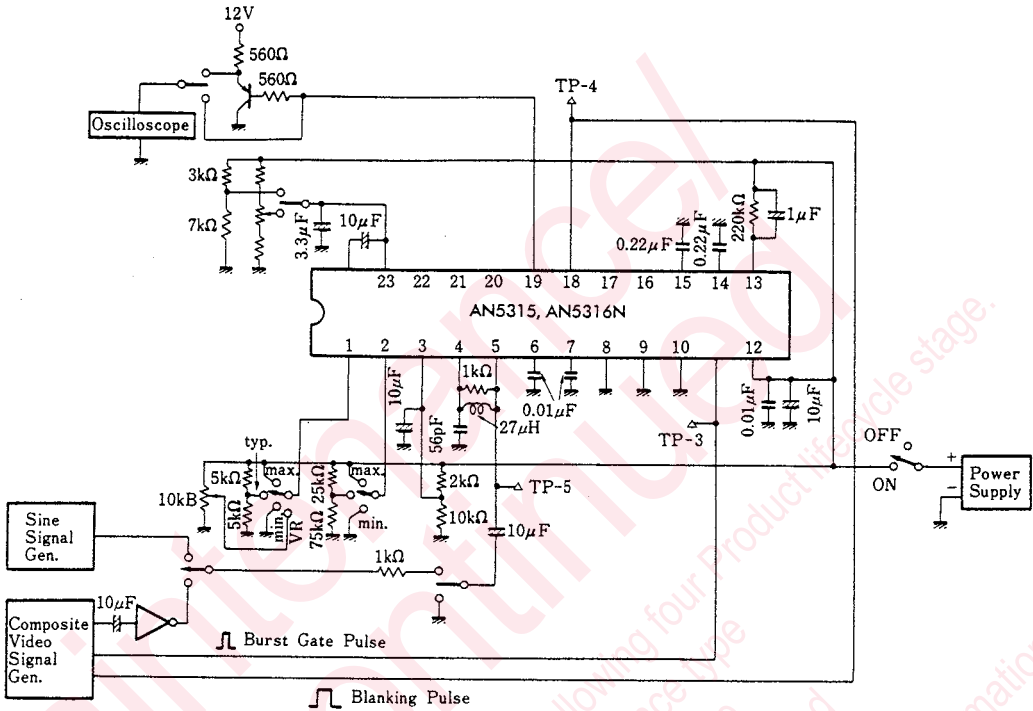
### ■ Electrical Characteristics ( $V_{CC}=12\text{V}$ , $T_a=25^\circ\text{C}$ )

Item	Symbol	Test Circuit	Condition	min.	typ.	max.	Unit	
Total Circuit Current	$I_{tot}$	1	$V_{CC}=12\text{V}$	35	47	59	mA	
Output Voltage	$V_{19-8}$	1	$V_{CC}=12\text{V}$	3.6	4.2	4.8	V	
	$V_{20, 21, 22-8}$	1		7.0	7.7	8.5	V	
Color Difference Output Voltage (1)	$e_{o(1)}$	2	Rainbow 150mV <sub>p-p</sub> , Color Auto, Contrast max.	1.50	1.85	2.20	V <sub>p-p</sub>	
ACC Characteristics	ACC	2	Rainbow 150mV <sub>p-p</sub> , Color Auto, Contrast max.	0.70	0.88	1.0	times	
Color Difference Output Voltage (2)	$e_{o(2)}$	2	Rainbow 150mV <sub>p-p</sub> , Color Manu. max., Contrast max.	4.9	5.7	6.3	V <sub>p-p</sub>	
Color Leak (4)	$e_{LC}$	2	Rainbow 150mV <sub>p-p</sub> , Color Manu. min., Contrast max.		25	50	mV <sub>p-p</sub>	
Oscillation Frequency	$f_{osc}$	3	Pin① input invalid signal, Trimmer to be set by standard samples			±150	Hz	
Control Sensitivity (VCO)	$\beta$	3	Frequency change when $V_1$ (8.6V) and $V_2$ (8.4V) are applied to Pin③	1.2	1.5	2.0	Hz/mV	
Phase Detector Sensitivity (APC)	$\mu$	3	Apply $\Delta\theta$ changed frequency for burst phase to Pin⑩ or 11. Pin⑩ voltage change	25	40	55	mV/deg.	
APC Pull-in Range	$f_{APC}$	3	Rainbow 150mV <sub>p-p</sub> , measured by changing burst frequency	±450	±600		Hz	
Tint Variable Range	$\theta(T_{int})$	2	Rainbow 150mV <sub>p-p</sub> , Color Manu. center, Tint min.~max.	±35	±45	±55	deg.	
Demodulation Output Ratio(1)	R/B	4	Pin⑦ 3.58MHz 150mV <sub>p-p</sub> Pin⑩ 3.59MHz 500mV <sub>p-p</sub>	0.86	0.94	1.04	times	
Demodulation Output Ratio(2)	G/B	4	Measure beat frequency of Pins⑧, ⑨, and⑩. R-Y Output/ B-Y Output G-Y Output/ B-Y Output	0.25	0.30	0.35	times	
Demodulation Angle(1)	$\angle R$	4	Pin⑦ 3.58MHz 150mV <sub>p-p</sub> Pin⑩ 3.59MHz 500mV <sub>p-p</sub>	94	97.5	102	deg.	
Demodulation Angle(2)	$\angle G$	4	Measure beat frequency of Pins⑧, ⑨, and⑩. $\angle B=0$ deg.	228	235	242	deg.	
Demodulation Output Residual Carrier	$e_{car}$	3	Input invalid signal, 3.58MHz of each output Carrier leak element			250	mV <sub>p-p</sub>	
Color Difference Output Contrast Ratio	$\Delta e_{oc}$	2	Rainbow 150mV <sub>p-p</sub> , Color Auto. center, Tint center, Contrast min.~max.	2.50	2.85	3.20	times	
Color Killer Level	$e_k$	3	Rainbow 150mV <sub>p-p</sub> , Color Auto. center, Tint center, Contrast max.	-32	-38	-42	dB	
Voltage Amplification (Video)	$A_v$	5	$f=20\text{kHz}$ $V_3=2/3V_{CC}$ , Contrast max.	6.9	7.6	8.3	times	
Video Output Contrast Ratio	$\Delta e_{vc}$	5	Sine wave input 0.1 V <sub>p-p</sub> $V_3=V_{CC}$ , Contrast max./min.	2.9	3.25	3.55	times	
Picture Variable Range	$\Delta f_{vp}$	5	$f=2.5\text{MHz}$ , 0.2 V <sub>p-p</sub> input, Contrast max., Picture max./min.	15	18	21	dB	
DC Transfer Rate	$T_{DC}$	5	Video input 0.2 V <sub>p-p</sub> , APL10~90%	AN5315	67	76	85	%
			AN5316N	81	87	95		
Y Output DC Voltage	$E_o$	3	Video input invalid signal, Contrast max.	2.9	3.9	4.9	V	
$E_o$ Change with Ambient Temperature	$\Delta E_o/\Delta T_a$	3	$T_a=-20\sim70^\circ\text{C}$		4.0		mV/ $^\circ\text{C}$	
Demodulation DC Output Voltage	$E_{o(DC)}$	3	Input invalid signal, VCO oscillation Demodulator outputs	7.4	7.8	8.2	V	
$E_{o(DC)}$ Change with Ambient Temperature	$\Delta E_{o(DC)}/\Delta T_a$	3	$T_a=-20\sim70^\circ\text{C}$		-1.7		mV/ $^\circ\text{C}$	

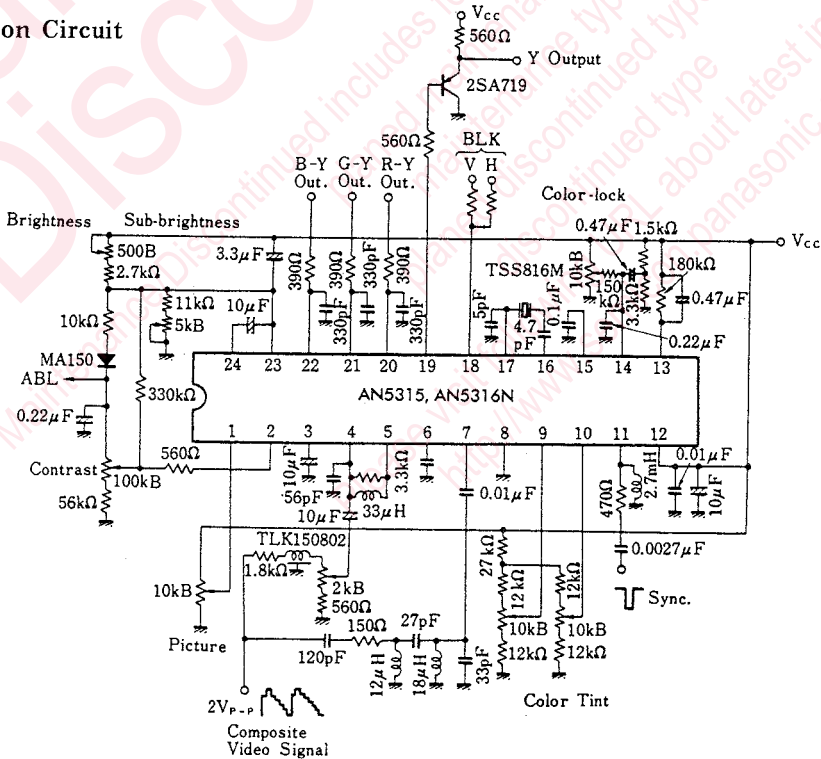




Test Circuit 5 ( $A_v$ ,  $\Delta v_{vc}$ ,  $\Delta f_{VP}$ ,  $T_{DC}$ )



Application Circuit



### ■ Pin

Pin No.	Pin Name	Pin No.	Pin Name
1	Picture Control	13	ACC Filter
2	Contrast Control	14	APC Filter
3	Black Level Filter	15	Color Killer Filter
4	Video Input(1)	16	3.58MHz Oscillator Output
5	Video Input(2)	17	3.58MHz Oscillator Input
6	Chrominance By-pass	18	Blanking Pulse Input
7	Chrominance Input	19	Y Output
8	GND	20	(R-Y) Output
9	Color Control	21	(G-Y) Output
10	Tint Control	22	(B-Y) Output
11	Burst Gate Pulse Input	23	Brightness Control
12	V <sub>cc</sub>	24	Pedestal Clamp Filter

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