

# BIPOLAR ANALOG INTEGRATED CIRCUIT $\mu$ PC1352C

## CHROMINANCE AND LUMINANCE PROCESSOR FOR NTSC COLOR TV

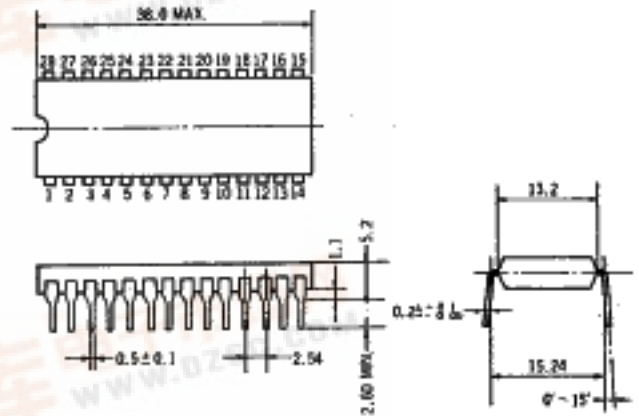
### DESCRIPTION

$\mu$ PC1352C is an integrated circuit for NTSC system to process both color and luminance signals of the color televisions. It is an MSI contained in a 28 pins dual in line package and provides two functions. One is the processing of color signal for the band pass amplifier, color synchronizer, demodulator circuits, and the other is the processing of luminance signal for the luminance amplifier and pedestal clamp circuits, the number of peripheral parts and controls can be minimized, and the manhours required for the assembling can be considerably reduced.

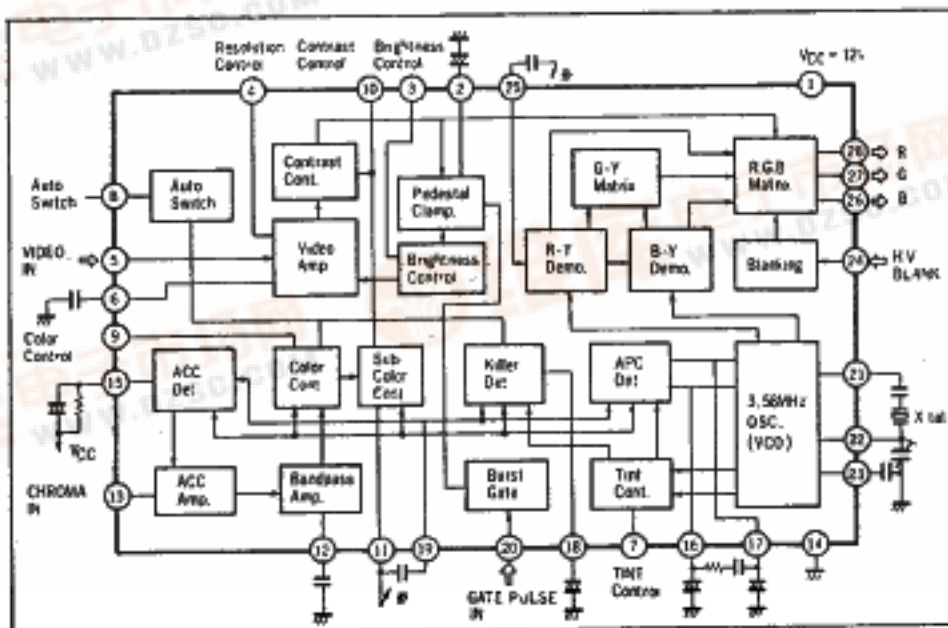
### FEATURES

- It needs very few external components, and minimize the adjustments.
- DC controlled circuits make a remote controlled system easy.
- Protection diodes in every input terminals and output terminals.
- "Color killer" does not need any adjustments.
- "Contrast" control does not prevent the natural color of the picture any more, as the color saturation level changes simultaneously.
- ACC (Automatic color controller) circuit operates very smoothly with peak level detector.
- "Brightness control" terminal can be used for ABL (Automatic beam limiter) also.

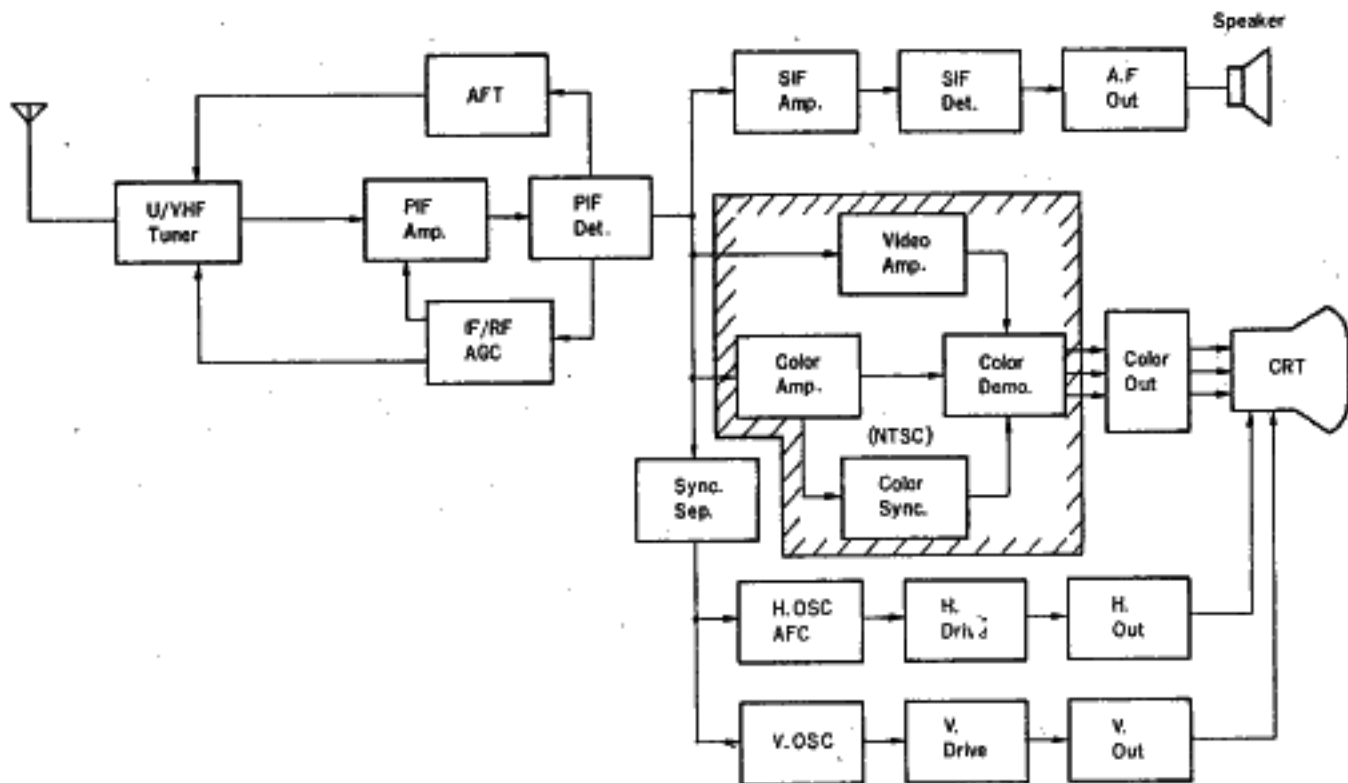
### PACKAGE DIMENSIONS in millimeters



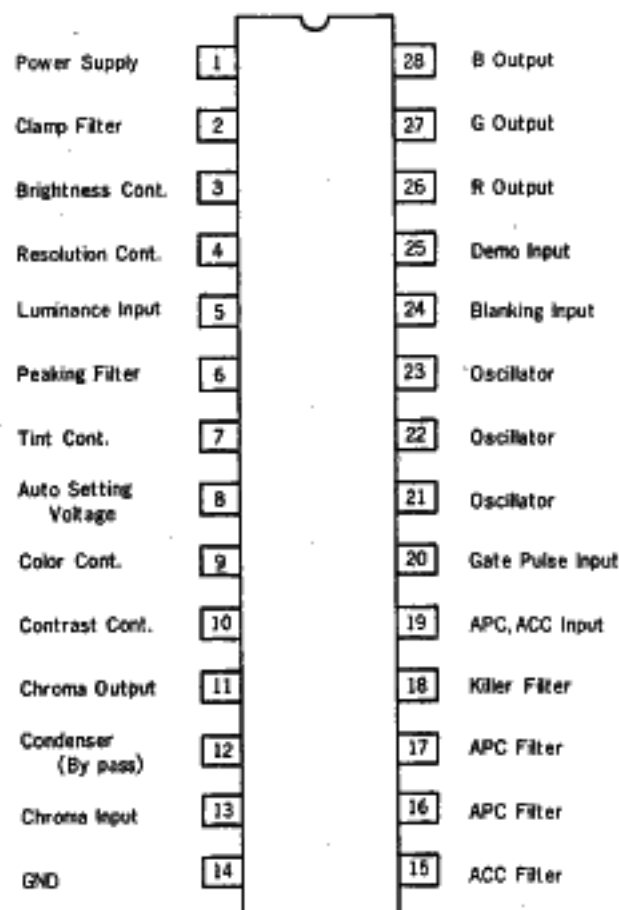
### BLOCK DIAGRAM



## TV BLOCK DIAGRAM



## PIN CONNECTION (Top View)



## THE STANDARD OPERATING CONDITIONS

Characteristic	Value	Unit
Supply Voltage	12	V
Chrominance Input Voltage (Burst signal level)	150	mVp-p
Luminance Input Voltage (Sync White Level)	1.0	Vp-p
Burst Gate Pulse Input Voltage	3.0	Vp
Blanking Pulse Input Voltage	2.5	Vp
Color saturation controlling Voltage Range	0~5.7 (at $V_{CC}=12$ V)	V
Tint controlling Voltage Range	0~5.7 (at $V_{CC}=12$ V)	V
Contrast controlling Voltage Range	0~12 (at $V_{CC}=12$ V)	V
Resolution controlling Voltage Range	0~12 (at $V_{CC}=12$ V)	V
Brightness controlling Voltage Range	8~10 (at $V_{CC}=12$ V)	V

Note: In case of operating in  $V_{CC}=14.4$  V, Set the surrounding temperature  $T_a$  to be  $67^{\circ}\text{C}$ .

ABSOLUTE MAXIMUM RATINGS ( $T_a = +25^{\circ}\text{C}$ )

Supply Voltage	$V_{CC}$	14.4	V
Brightness Controlling Voltage	V3	14.4	V
Resolution Controlling Voltage	V4	14.4	V
Contrast Controlling Voltage	V10	14.4	V
Tint Controlling Voltage	V7	14.4	V
Color Controlling Voltage	V9	14.4	V
Auto Controlling Voltage	V8	14.4	V
Luminance Input Signal Voltage	V5	+5	V
Chrominance Signal Input Voltage	V13	+2.5	V
Demodulator Input Signal Voltage	V25	+5	V
R.G.B Output Current	I26,I27,I28	-40	mA
Gate Pulse Input Voltage	V20	+5	V
Gate Pulse Output Current	I20	-10	mA
Blanking Pulse Input Voltage	V24	$\pm 6$	V
Power Dissipation	$Pd1$ ( $T_a=25^{\circ}\text{C}$ )	1.2	W
Power Dissipation	$Pd2$ ( $T_a=70^{\circ}\text{C}$ )	750	mW
Operating Temperature	$T_{opt}$	$-20\sim+70$	$^{\circ}\text{C}$
Storage Temperature	$T_{stg}$	$-40\sim+125$	$^{\circ}\text{C}$

Test Conditions ( $V_{CC}=12$  V)

Characteristic	MIN.	TYP.	MAX.
Color saturation controlling terminal 9	0 V	$V8/2$ V	V8 V
Tint controlling terminal 7	0 V	$V8/2$ V	V8 V
Contrast controlling terminal 10	0 V	$V_{CC} \times 0.78$ V	$V_{CC}$ V
Resolution controlling terminal 4	0 V	-	$V_{CC}$ V

ELECTRICAL CHARACTERISTICS ( $T_a=25^\circ\text{C}$  unless otherwise noted  $V_{CC}=12\text{V}$ )

Color control is manual state and tint is center for the items not specifically specified

No.	Characteristic	Symbol	Test Ckt.	Test Condition	MIN.	TYP.	MAX.	Unit
1	Supply Current	$I_{CC}$	1		32	43	54	mA
2	Burst Output Voltage	$e_b$	3	Rainbow color bar signal input 150 mVp-p, Color auto center, Contrast max.	0.5	0.7	0.9	Vp-p
3	ACC Range 1	ACC1	3	Rainbow color bar signal input 300 mVp-p, Burst Output Voltage/ $e_b$	0.9	1.0	1.1	times
4	ACC Range 2	ACC2	3	Rainbow color bar signal input 15 mVp-p, Burst Output Voltage/ $e_b$	0.6	0.8	1.0	times
5	Chroma Output Voltage 1	$e_{c1}$	3	Rainbow color bar signal input 150 mVp-p, Color min, Contrast max.	0.5	0.7	0.9	Vp-p
6	Chroma Output Voltage 2	$e_{c2}$	3	Rainbow color bar signal input 150 mVp-p, Color min, Contrast max.	-	-	5	mVp-p
7	Chroma Output Voltage 3	$e_{c3}$	3	Rainbow color bar signal input 150 mVp-p, Color center, Contrast max.	120	190	260	mVp-p
8	Chroma Output Voltage 4	$e_{c4}$	3	Rainbow color bar signal input 150 mVp-p, Color auto center, Contrast max.	130	190	260	mVp-p
9	Variable Range of Chroma Output Voltage at auto	$\Delta^{\circ}ca$	3	Rainbow color bar signal input 150 mVp-p, Color auto max min, Contrast max.	+25 -25	+35 -35	+45 -45	%
10	Free running Frequency	$f_o$	2	No input signal to Terminal 19 Be trimmed 3.579545 MHz by using a trimer capacitor for standard sample, Deviation from $f$ ; 3.579545 MHz	-	-	$\pm 150$	Hz
11	Oscillator controlling sensitivity	$\beta$	2	Burst signal input 0.7 Vp-p, Converted from V16-17 in case of 100 Hz burst frequency variation	1.0	1.5	2.0	Hz/mV
12	Phase detector sensitivity	$\mu$	2	Burst signal input 0.7 Vp-p, Converted from phase error and V16-17 in case of 100 Hz burst frequency variation	25	45	65	mV/ degree
13	Phase error	$\Delta\phi$	2	Burst signal input 0.7 Vp-p, Phase error to 100 Hz of burst frequency variation	-	1.5	3.0	degree /100 Hz
14	A.P.C. pull-in frequency range	$f_p$	2	Burst signal input 0.7 Vp-p, Measured by changing the burst frequency	$\pm 350$	$\pm 500$	-	Hz
15	Variable Range of Tint	$\Delta\theta 1$	2	Burst signal input 0.7 Vp-p, Tint; max min, manual, Tint center, Range from 0 as a standard	+37 -37	+45 -45	+53 -53	degree
16	Variable Range of Tint at auto	$\Delta\theta 2$	2	Burst signal input 0.7 Vp-p, Tint; max min, auto Tint center, Range from 0 as a standard	12 -12	+17 -17	+22 -22	degree

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No.	Characteristic	Symbol	Test Ckt.	Test Condition	MIN.	TYP.	MAX.	Unit
17	B-Y Output Voltage	$e_{o1}$	3	Dem. input 0.2 Vp-p, f=3.59 MHz, Bright VR was set to be V26=3.5 V(DC) No blanking input	1.5	2.0	2.5	Vp-p
18	Ratio of R-Y to B-Y	R/B	3	Dem. input 0.2 Vp-p, f=3.59 MHz, R Output Voltage/ $e_{o1}$ Bright VR was set to be V26=3.5 (DC) No blanking input	0.86	0.94	1.04	times
19	Ratio of G-Y to B-Y	G/B	3	Dem. input 0.2 Vp-p, f=3.59 MHz, G Output Voltage/ $e_{o1}$ Bright VR was set to be V26=3.5 V(DC) No blanking input	0.26	0.30	0.35	times
20	Relative Output phase G-Y to R-Y	$\angle R$	3	Dem. input 0.2 Vp-p, f=3.59 MHz, B=0 degree, phase difference Bright VR was set to be V26=3.5 V(DC) No blanking input	94	97.5	102	degree
21	Relative Output phase G-Y to B-Y	$\angle G$	3	Dem. input 0.2 Vp-p, f=3.59 MHz, B=0 degree, phase difference Bright VR was set to be V26=3.5 V(DC) No blanking input	228	235	242	degree
22	Maximum Color difference Output Voltage	$e_{o2}$	3	Dem. input 1.2 Vp-p, f=3.59 MHz, Bright VR was set to be V26=3.5 V(DC) No blanking input	4.8	5.7	-	Vp-p
23	Residual Carrier	$e_{car}$	3	No signal input, Output; 3.58 MHz each, Carrier leak component, Bright VR was set to be V26=3.5 V(DC) No blanking input	-	-	100	mVp-p
24	Demodulation frequency characteristic	$e_{of}$	3	Attenuation factor of demodulation output at f=500 kHz, Dem. input 0.2 Vp-p, f=3.08 MHz, Assuming the output at f=10 kHz is 0 dB	-1.5	-0.9	-0.4	dB
25	Overall Color difference Output Voltage	$e_{o3}$	3	Rainbow color bar signal input 150 mVp-p, Color auto center, Contrast max, in R output	1.0	1.7	2.4	Vp-p
26	Overall Color difference Output Variable Range by Contrast	$\Delta e_{oc}$	3	Rainbow color bar signal input 150 mVp-p, Color auto center, Contrast max/min, in R output	3.4	3.85	4.3	Vp-p
27	Color killer tolerance	$e_k$	3	Burst input Voltage at terminal 13 150 mVp-p=0 dB, Attenuation value in operating the killer	-27	-32	-40	dB
28	Luminance Gain	$A_{v1}$	3	R,G,B Output each, Studio color bar input 1 Vp-p in white level, Contrast max, Resolution min, Pedestal of terminal 26 is 2 V, Bright VR was set	4.5	5.0	5.5	times
29	Luminance Gain Variable Range by Contrast	$\Delta e_{vc}$	3	Studio color bar input 1 Vp-p in white level, Contrast max/min, Resolution min, in B output	4.0	4.5	5.0	times

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PC 13520

NEC ELECTRON DEVICE

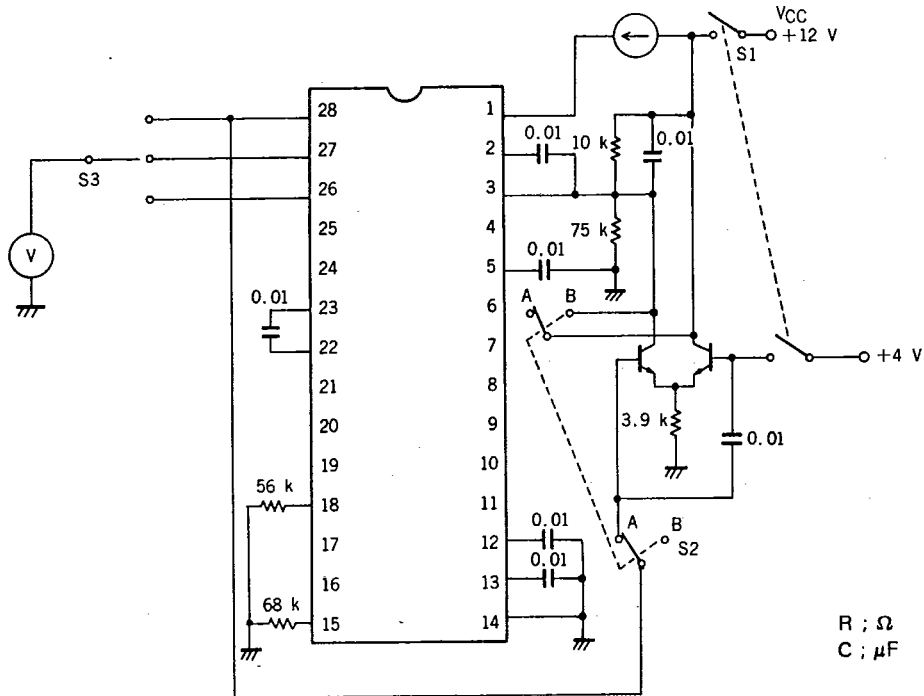
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DT-77-07-09

No.	Characteristic	Symbol	Test Ckt.	Test Condition	MIN.	TYP.	MAX.	Unit
30	Luminance Amp. frequency characteristic	$f_v$	3	Sine wave signal input 0.1 Vr.m.s. Input frequency at Av1=-6 dB Resolution min, in B output, Bright VR was set to be V26=3.5 V(DC) No blanking input, 0 dB=16 kHz Output	5	6	-	MHz
31	Resolution Variation Range	$\Delta f_{vp}$	3	Sine wave signal 0.1 Vr.m.s., f=2 MHz Contrast max, Resolution min~max, in B Output max/min	5.0	7.0	9.0	dB
32	DC Restored	$T_{DC}$	3	Stair Step signal input 1 Vp-p, APL 10~90 % in B Output	65	75	85	%
33	Brightness controlling sensitivity	BR	3	$\Delta E_o/\Delta V_3$ , $E_o=2V\sim 5V$ , R,G,B Output each	4.0	4.5	5.0	-
34	Maximum R,G,B Output Voltage	$E_{oM}$	1	R,G,B Output Voltage each at V3=12 V	7.0	-	-	V
35	Differential Gain	D.G.	3	Stair Step signal input 1 Vp-p, f=3.58 MHz, APL=50 %, Contrast max, Resolution min, Pedestal of terminal 26 is 2 V, Bright VR was set	-	-	5.0	%
36	Quiescent Output Voltage	$E_o$	3	R,G,B Output each, Bright VR was set to be V3=9 V, No Luminance signal input, Contrast max, VCO is operating, Blanking	2.5	3.5	4.5	V
37	$E_o$ Supply Voltage Coefficient	$E_{o-v}$	3	VCC=12 V $\pm$ 20 %, V26=3.5 V (VCC=12 V), R, G, B Output each Blanking	0.2	0.25	0.3	V/V
38	$E_o$ Temperature Coefficient	$\Delta E_{o-t}$	3	Ta=-20~+70 °C, V26=3.5 V (Ta=25 °C) R,G,B Output each	-4.0	-2.0	0	mV/°C
39	Difference Output Voltage	$\Delta E_{R-G}$ $\Delta E_{G-B}$ $\Delta E_{B-R}$	3	V26=3.5 V VCO is operating, R,G,B Output each, No blanking input	-	0	300	mV

Test Circuit 1



R ; Ω  
C ; μF

Supply Current	$I_{CC}$	S1 ; ON	S2 ; Side A	
Maximum R,G,B	$E_{OM}$	S1 ; ON	S2 ; Side B	S3 ; Each
Output Voltage				











PC1352C

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Characteristic	Symbol	Test CKt	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	1	2	3	4	Measuring Apparatus	
			Power Supply	Tint	Auto	Burst (B-Y) Input	Burst freq	Power Supply	Lumiance Input	Auto	Color	Contrast	Chroma Input	ACC	Pulse Input	VCO	Demo Input	R G B	Demo Output	Attenuator	Bright-ness	Bright-ness	Resolu-tion	ACC Level	
Burst Output Voltage	$e_b$	3	OFF ↓ ON					OFF ↓ ON	OFF	ON	CEN	MAX	IN	FIX	IN	OP	INT	-	$e_{o3}$	A TP-2 150 mVp-p	-	-	MIN	-	Oscilloscope Burst signal
ACC Range 1	ACC1	3	OFF ↓ ON					OFF ↓ ON	OFF	ON	CEN	MAX	IN	FIX	IN	OP	INT	-	$e_{o3}$	A TP-2 300 mVp-p	-	-	MIN	-	Oscilloscope Burst signal
ACC Range 2	ACC2	3	OFF ↓ ON					OFF ↓ ON	OFF	ON	CEN	MAX	IN	FIX	IN	OP	INT	-	$e_{o3}$	A TP-2 150 mVp-p	-	-	MIN	-	Oscilloscope Burst signal
Chroma Output Voltage	$e_{c1}$	3	OFF ↓ ON					OFF ↓ ON	OFF	OFF	MAX	IN	IN	FIX	IN	OP	INT	-	$e_{o3}$	A TP-2 150 mVp-p	-	-	MIN	-	Oscilloscope Chroma signal
Chroma Output Voltage	$e_{c2}$	3	OFF ↓ ON					OFF ↓ ON	OFF	OFF	MIN	IN	IN	FIX	IN	OP	INT	-	$e_{o3}$	A TP-2 150 mVp-p	-	-	MIN	-	Oscilloscope Chroma signal
Chroma Output Voltage	$e_{c3}$	3	OFF ↓ ON					OFF ↓ ON	OFF	OFF	CEN	MAX	IN	FIX	IN	OP	INT	-	$e_{o3}$	A TP-2 150 mVp-p	-	-	MIN	-	Oscilloscope Chroma signal
Chroma Output Voltage	$e_{c4}$	3	OFF ↓ ON					OFF ↓ ON	OFF	ON	CEN	MAX	IN	FIX	IN	OP	INT	-	$e_{o3}$	A TP-2 150 mVp-p	-	-	MIN	-	Oscilloscope Chroma signal
Variable Range of Chroma Output Voltage at auto	$\Delta c_a$	3	OFF ↓ ON					OFF ↓ ON	OFF	ON	MAX ↓ MIN	MAX	IN	FIX	IN	OP	INT	-	$e_{o3}$	A TP-2 150 mVp-p	-	-	MIN	-	Oscilloscope Variation of Chroma signal
Free running Frequency	$f_o$	2	OFF ↓ ON	CEN	ON	OFF	-																		Frequency Counter
Oscillator controlling sensitivity	$\beta$	2	OFF ↓ ON	CEN	ON	IN	+f CEN -f																		D.C. Voltage Meter
Phase Det. sensitivity	$\mu$	2	OFF ↓ ON	CEN	ON	IN	+f CEN -f																		Vector Scope D.C. Vol. Meter Difference APC Voltage
Phase error	$\Delta \phi$	2	OFF ↓ ON	CEN	ON	IN	+f CEN -f																		Vector Scope
A.P.C. pull-in Freq. range	$f_p$	2	OFF ↓ ON	CEN	ON	IN	+f CEN -f																		Oscilloscope
Variable Range of Tint	$\Delta 01$	2	OFF ↓ ON	MAX ↓ MIN	OFF	IN	CEN																		Vector Scope
Variable Range of Tint at auto	$\Delta 02$	2	OFF ↓ ON	MAX ↓ MIN	OFF	IN	CEN																		Vector Scope
B-Y Output Voltage	$e_{o1}$	3	OFF ↓ ON					OFF ↓ ON	OFF	-	-	-	OFF	FIX	OFF	OP	EXT 0.2 Vp-p F-2,39	R G B	$e_{o3}$	-	-	-	MIN	-	Oscilloscope Demo. Output Voltage B

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Characteristic	Symbol	Test Ckt	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	1	2	3	4	Measuring Apparatus
Ratio of R-Y to B-Y	R/B	3					OFF ↓ ON	OFF	-	-	-	OFF	FIX	OFF	OP	EXT 0.2 Vp-p f=3.59	R	ε <sub>03</sub>	-	Bright-ness	V26= 3.5 V	MIN	-	Oscilloscope Demo. Output Voltage R B
Ratio of G-Y to B-Y	G/B	3					OFF ↓ ON	OFF	-	-	-	OFF	FIX	OFF	OP	EXT 0.2 Vp-p f=3.59	G	ε <sub>03</sub>	-	Bright-ness	V26= 3.5 V	MIN	-	Oscilloscope Demo. Output Voltage G B
Relative Output phase B-Y to R-Y	/R	3					OFF ↓ ON	OFF	-	-	-	OFF	FIX	OFF	OP	EXT 0.2 Vp-p f=3.59	B	ε <sub>03</sub>	-	Bright-ness	V26= 3.5 V	MIN	-	Phase Meter Relative phase R B
Relative Output phase G-Y to B-Y	/G	3					OFF ↓ ON	OFF	-	-	-	OFF	FIX	OFF	OP	EXT 0.2 Vp-p f=3.59	G	ε <sub>03</sub>	-	Bright-ness	V26= 3.5 V	MIN	-	Phase Meter Relative phase B G
Maximum Detected Output Voltage	e <sub>02</sub>	3					OFF ↓ ON	OFF	-	-	-	OFF	FIX	OFF	OP	EXT 1.2 Vp-p f=3.59	B	ε <sub>03</sub>	-	Bright-ness	V26= 3.5 V	MIN	-	Oscilloscope Demo. Output Voltage B R
Residual Carrier	e <sub>car</sub>	3					OFF ↓ ON	OFF	-	-	-	OFF	FIX	OFF	OP	EXT No.	R	ε <sub>0c</sub>	-	Bright-ness	V26= 3.5 V	MIN	-	Oscilloscope Output 3.58M Carrier
Demodulation characteristic frequency	e <sub>0f</sub>	3					OFF ↓ ON	OFF	-	-	-	OFF	FIX	OFF	OP	EXT 0.2 Vp-p f=3.08	R	OFF	-	Bright-ness	V26= 3.5 V	MIN	-	A.C. Voltage Meter
Overall Detected Output Vol.	e <sub>03</sub>	3					OFF ↓ ON	OFF	ON	CEN	MAX	IN	FIX	IN	OP	INT	R	ε <sub>03</sub>	A	Bright-ness	V26= 3.5 V	MIN	-	Oscilloscope Demo. Output Voltage R
Overall Detected Output Variable Range by Cont. controlling	Δe <sub>0c</sub>	3					OFF ↓ ON	OFF	ON	CEN	MAX ↓ MIN	IN	FIX	IN	OP	INT	R	ε <sub>03</sub>	A	Bright-ness	V26= 3.5 V	MIN	-	Oscilloscope Demo. Output Voltage R
Color killer tolerance	e <sub>k</sub>	3					OFF ↓ ON	OFF	-	-	-	IN	FIX	IN	OP	INT	R	ε <sub>03</sub>	A	Bright-ness	V26= 3.5 V	MIN	-	Oscilloscope Demo. Output Voltage R
Luminance Gain 1	AV1	3					OFF ↓ ON	IN Studio Color Bar White 1 Vp-p	-	-	-	OFF	VAR	IN	NOP	EXT NO.	R G B	OFF	-	Bright-ness	Terminal 26 Pedestal 2 V	MIN	V15= 8 V	Oscilloscope ev.
Luminance Gain Variable Range by Contrast cont.	Δe <sub>ve</sub>	3					OFF ↓ ON	IN Studio Color Bar White 1 Vp-p	-	-	-	OFF	VAR	IN	NOP	EXT NO.	B	OFF	-	Bright-ness	Terminal 26 Pedestal 2 V	MIN	V15= 8 V	Oscilloscope ev.
Luminance Amp Frequency characteristic	f <sub>v</sub>	3					OFF ↓ ON	IN Sine Wave 0.1 Vr.m.s.	-	-	-	OFF	VAR	OFF	NOP	EXT NO.	B	OFF	-	Bright-ness	V26= 3.5 V	MIN	V15= 8 V	A.C. Voltage Meter 0 dB=16 kHz ev.
Resolution Variation Range	Δf <sub>vp</sub>	3					OFF ↓ ON	IN Sine Wave 2M 0.1 Vr.m.s.	-	-	-	OFF	VAR	OFF	NOP	EXT NO.	B	OFF	-	Bright-ness	V26= 3.5 V	MIN MAX	V15= 8 V	A.C. Voltage Meter ev.

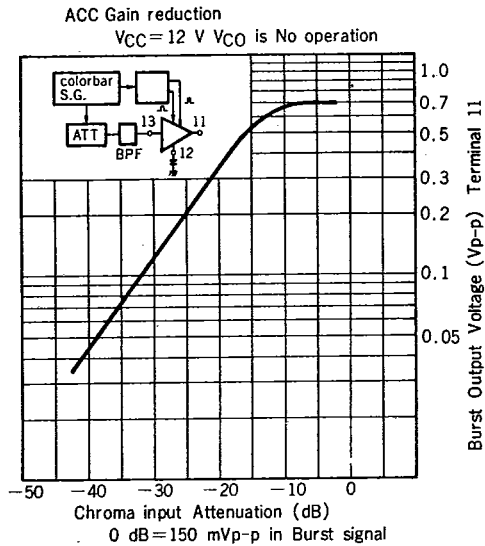
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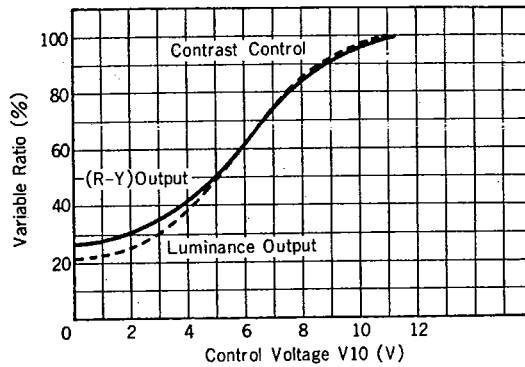
Characteristic	Symbol	Test Ckt	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	1	2	3	4	Measuring Apparatus
D.C. Transfer	TDC	3					OFF ↓ ON	IN Stair step 1 Vp-p APL 90%			MAX	OFF	VAR	IN	NOP	EXT NO.	R G B	OFF			Terminal 26 Pedestal 2V	MIN	V15= 8V	Oscilloscope ev
Brightness Controlling Sensitivity	BR	3					OFF ↓ ON	OFF			MAX	OFF	VAR	IN	OP	EXT NO.	R G B	903			903 D.C. 2-5V	MIN	V15= 8V	V3 903 D.C. Voltage Meter
Differential Gain	D.G.	3					OFF ↓ ON	IN Stair step APL 50%			MAX	OFF	VAR	IN	NOP	EXT NO.	B	OFF			Terminal 26 Pedestal 2V	MIN	V15= 8V	Vector Scope ev
Quiescent Output Voltage	E <sub>0</sub>	3					OFF ↓ ON	OFF			MAX	OFF	FIX	IN	OP	EXT NO.	R G B	903			V3= 9V	MIN	-	D.C. Voltage Meter
E <sub>0</sub> Supply Vol. Coefficient	E <sub>0-v</sub>	3					OFF ↓ ON	OFF				OFF	FIX	IN	OP	EXT NO.	R G B	903			V3= 9V	MIN	-	D.C. Voltage Meter
E <sub>0</sub> Temperature Coefficient	E <sub>0-t</sub>	3					OFF ↓ ON	OFF				OFF	FIX	IN	OP	EXT NO.	R G B	903			V3= 9V	MIN	-	D.C. Voltage Meter
Difference Output Voltage	ER-G EG-B EB-R	3					OFF ↓ ON	OFF				OFF	FIX	OFF	OP	EXT NO.	R G B	903			V76= 3.5V (VCC 12V)	MIN	-	D.C. Voltage Meter

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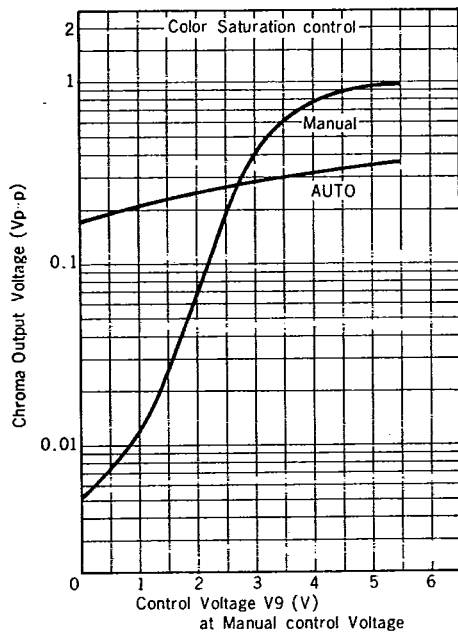
**ACC Characteristic**



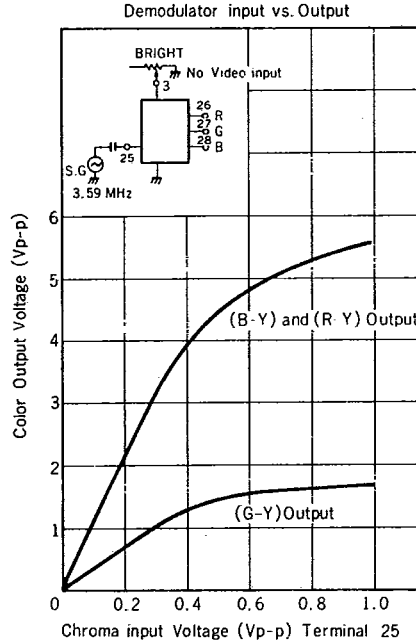
**Contrast Control Characteristic**



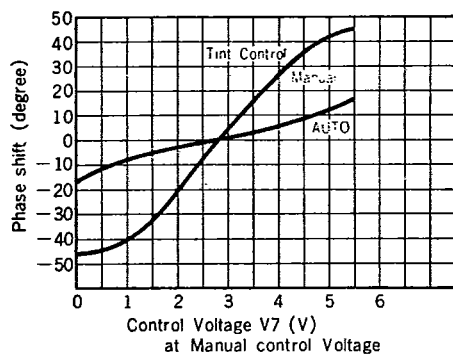
**Color Control Characteristic**



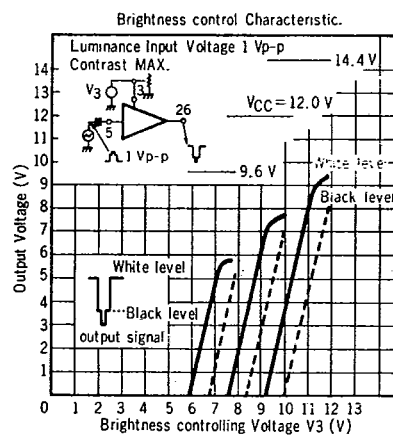
**Brightness Control Characteristic**



**Tint Control Characteristic**



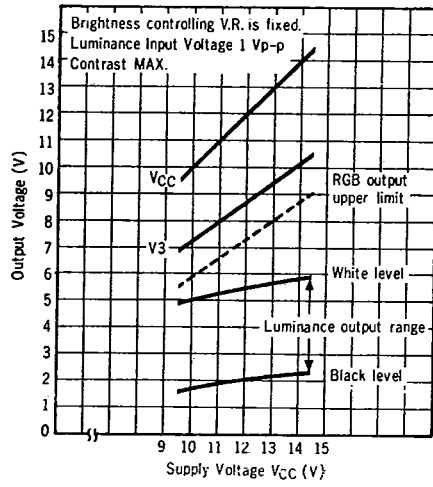
**Demodulator Input-Output**



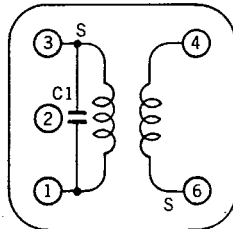
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R.G.B. Output Stage Dynamic Page

Luminance Output Voltage vs. Supply Voltage Characteristic.



$\mu$ PC1352C BAND PASS COIL

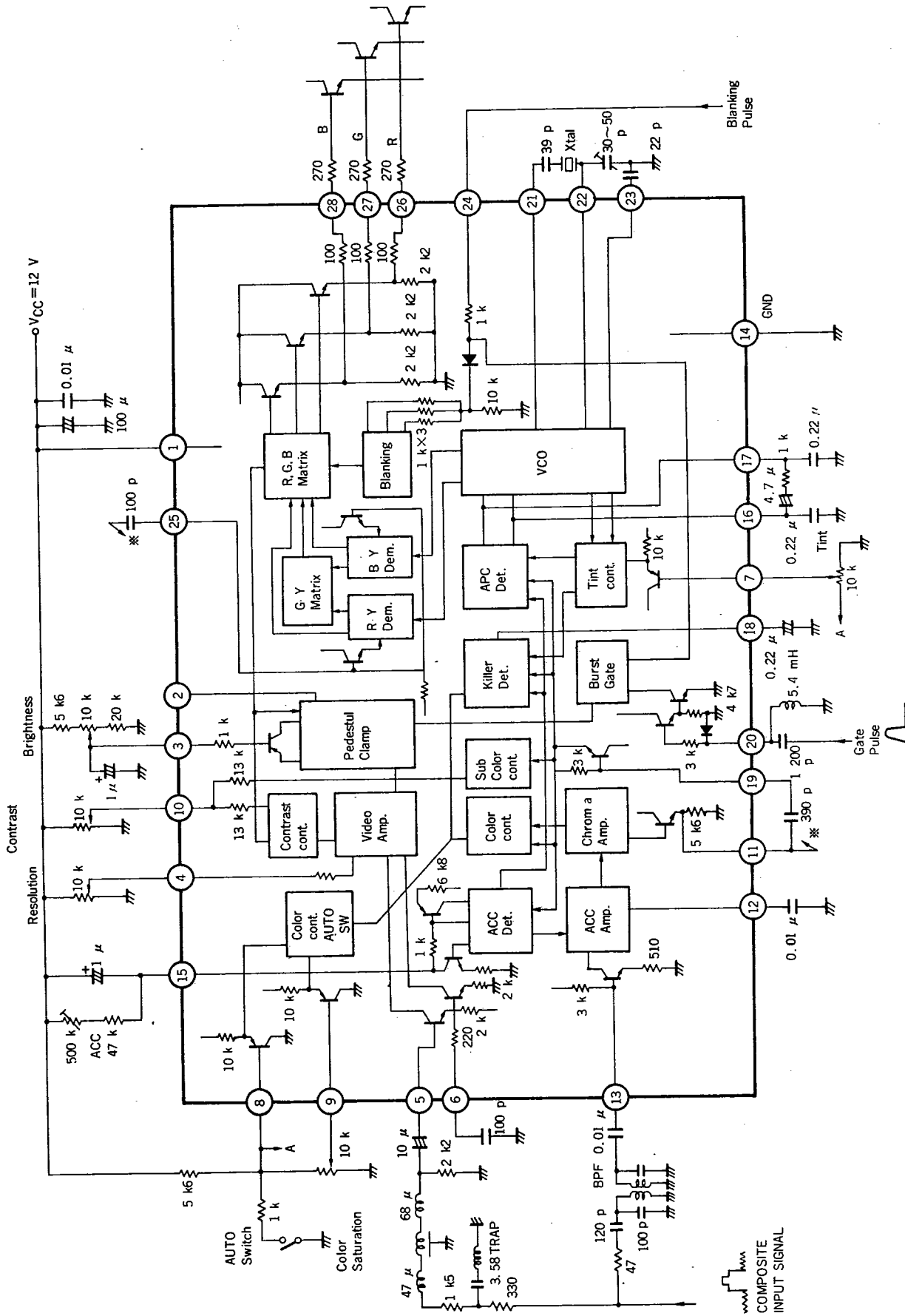


Pin Connection

- ①-③ 88T       $Q_u$  15±20 % at  $f=3.58$  MHz
- ④-⑥ 43-1/4T       $Q_u$  24±20 % at  $f=3.58$  MHz
- WIRE MATERIAL  
0.12  $\phi$  OUEW
- INSIDE CAPACITOR  
 $C_1 = 47$  pF

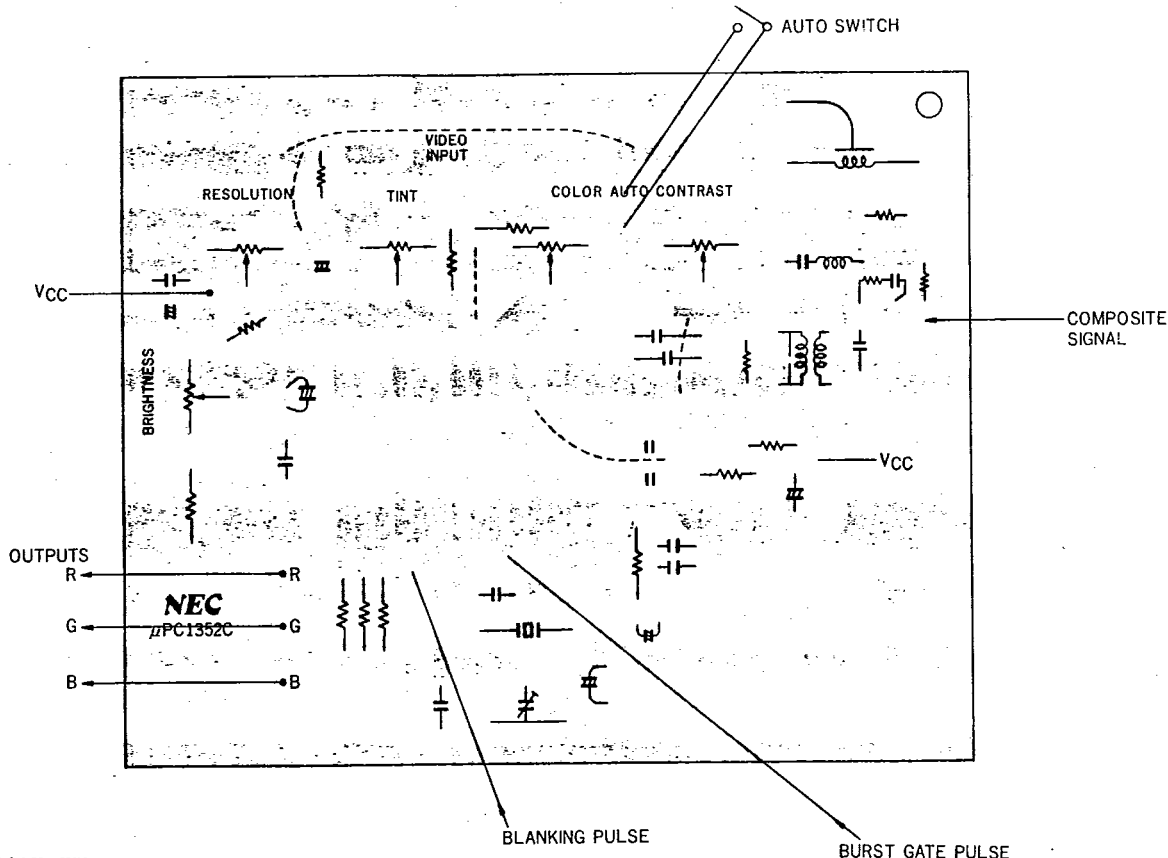
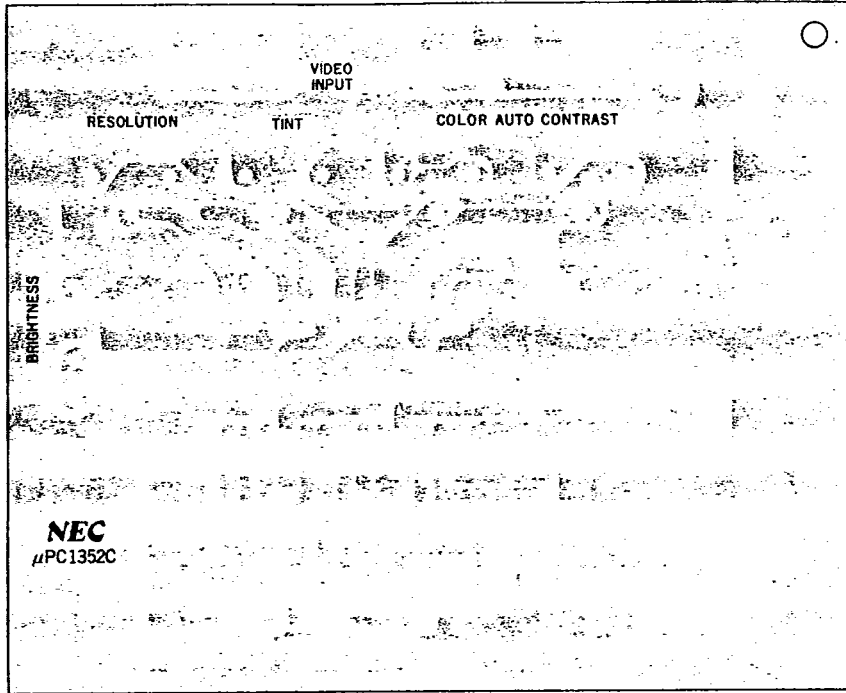


APPLICATION CIRCUIT



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$\mu$ PC1352C PRINTED CIRCUIT BOARD PATTERN (BOTTOM VIEW)



Please note our new name,  
NEC Corporation  
starting April 1, 1983.