

BIPOLAR ANALOG INTEGRATED CIRCUIT

μ PC1364C2

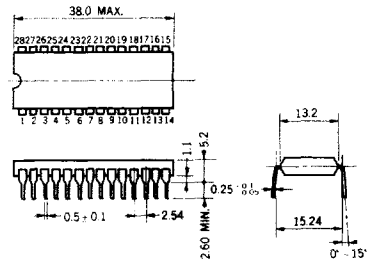
CHROMINANCE PROCESSOR FOR SECAM COLOR TV SILICON BIPOLAR MONOLITHIC INTEGRATED CIRCUIT

μ PC1364C2 is an integrated circuit for the chrominance signal processing of SECAM system receivers. This IC in 28 pins dual in line package has the functions required for the chrominance signal processing such as limiters, (R-Y)/(B-Y) demodulators, SECAM switch, identification circuit, killer, color control, clamp and R/G/B matrix circuit. The outputs are available in original R, G, B color signals. In addition, by the combination with NEC's PAL chrominance IC - μ PC1365C, PAL/SECAM dual system can be realized.

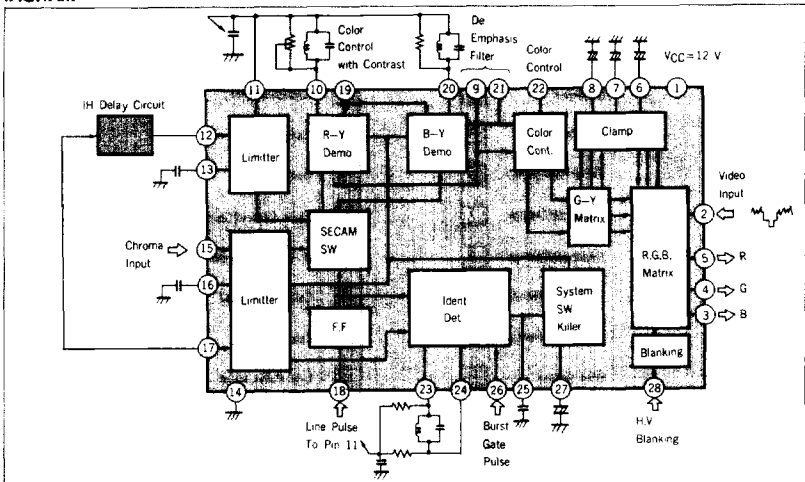
FEATURES

- R, G, B outputs in original color signals.
- PAL/SECAM dual system capability by the combination of μ PC1364C2 and μ PC1365C.
- Excellent white balance and crosstalk characteristics.
- Simple adjustment for contrast level and color control.

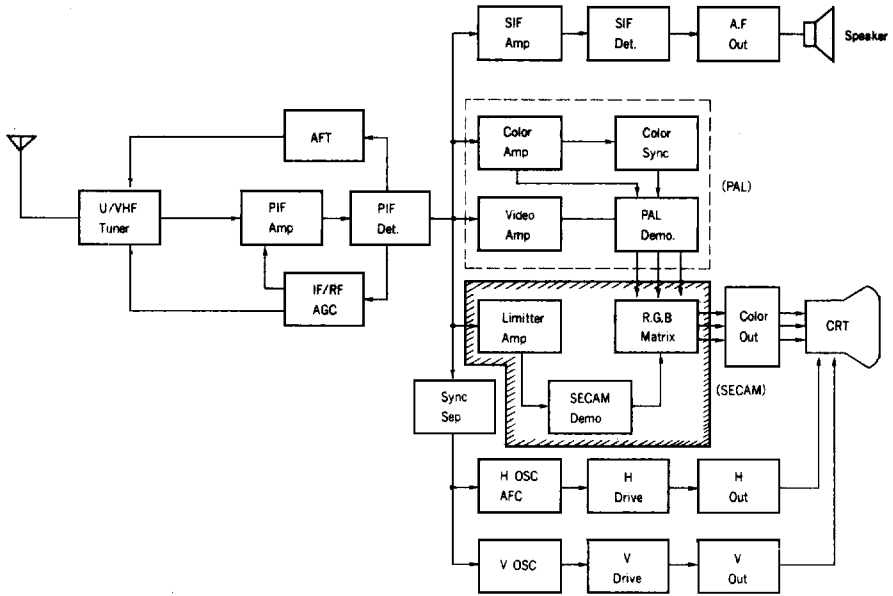
PACKAGE DIMENSIONS in millimeters



BLOCK DIAGRAM



**TV BLOCK DIAGRAM
(PAL-SECAM DUAL SYSTEM)**



PIN CONNECTION (Top View)

Power Supply	1	28	Blanking Pulse Input
Video Input	2	27	Capacitor(Killer)
B Output	3	26	Burst Gate Pulse Input
G Output	4	25	Capacitor(Ident)
R Output	5	24	Coil(Ident)
Capacitor(Clamp)	6	23	Coil(Ident)
Capacitor(Clamp)	7	22	Color Control(Contrast)
Capacitor(Clamp)	8	21	B-Y de-emphasis
R-Y de-emphasis	9	20	Coil(B-Y Demo)
Coil (R-Y Demo)	10	19	Color Control
Bias Output	11	18	Line Pulse Input
Chroma Input 2 (Delayed Signal)	12	17	Chroma Output
Capacitor (by-pass)	13	16	Capacitor(by-pass)
G.N.D.	14	15	Chroma Input 1 (Direct Signal)

STANDARD USING CONDITIONS

Supply Voltage	12	V
Chroma Input Signal (Burst Signal)	200	mV _{p-p}
Video Input Signal	1	V _{p-p}
Video Input Signal (Black Level)	10	V _{DC}
Burst Gate Pulse	3	V _p
Line Pulse	3	V _p
Blanking Pulse	3	V _p
R.G.B. Output Black Level	2	V
Color Controlling Voltage (Pin 19)	5.2 to 6.7 to 8.2	V
Color Controlling Voltage (Pin 22)	5.9 to 7.4 to 8.9	V
(Relative Contrast)		

ABSOLUTE MAXIMUM RATINGS (Ta = 25 °C Unless otherwise)

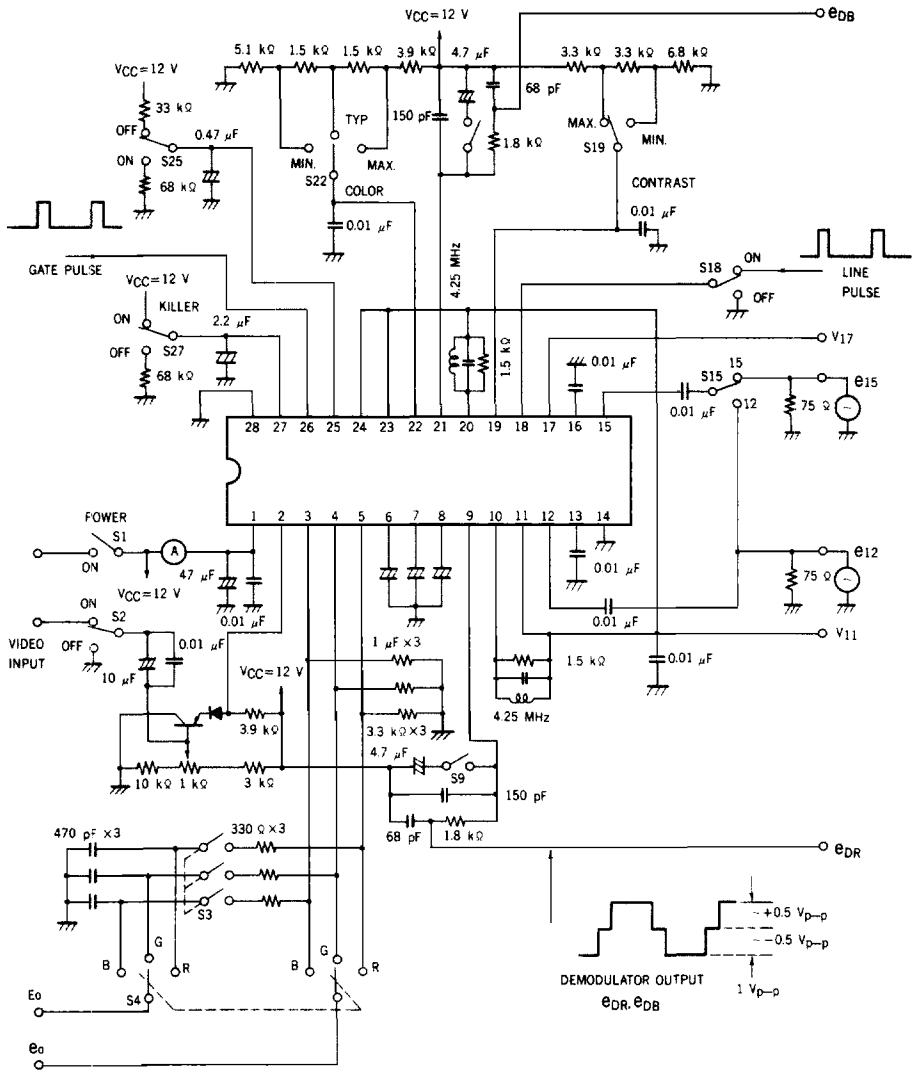
Supply Voltage	V _{CC}	15	V
Signal Input Voltage	e _i	5	V _{p-p}
Pulse Input Voltage	e _p	±6	V
Power Dissipation	P _d (Ta = +70°C)	750	mW
Operating Temperature	T _{opt}	-20 to +70	°C
Storage Temperature	T _{stg}	-40 to +125	°C

ELECTRICAL CHARACTERISTICS (Ta = 25 °C unless otherwise noted, VCC = 12 V) Contrast max, Color typ.

NO	CHARACTERISTIC	SYMBOL	TEST CKT	MIN.	TYP.	MAX.	UNIT	TEST CONDITION
1	Supply Current	I _{CC}	1	33	45	57	mA	No Input Signal, Killer on V3 = 3.5 V
2	Pin 11 Voltage	V ₁₁	1	1.9	2.3	2.7	V	Same as No. 1
3	Pin 17 Voltage (Killer off)	V ₁₇	1	8.0	8.6	9.2	V	Same as No. 1, Killer off
4	Pin 17 Voltage (Killer on)	V _{17k}	1	11.0	11.3	11.6	V	Same as No. 1, Killer on
5	Demodulator Output	e _{DB} , e _{DR}	1	0.6	0.9	1.3	V _{p-p}	f12 = 4.02 MHz, f15 = 4.48 MHz, e12 = e15 = 200 mV _{p-p}
6	Limiting Sensitivity	e _L	1	2.5	5	10	mV _{p-p}	f15 = 4.25 MHz ± 230 kHz, e _{DB} = -3 dB
7	A.M. Reject Ratio	AMR	1	34	40	-	dB	f15 = 4.25 MHz, AM mod = 30 %, fm = 1 kHz, e15 = 200 mV _{p-p} Line Pulse off, Compare with e _{DB}
8	Cross talk Level	CT	1	37	43	-	dB	f12 = 4.30 MHz, f15 = 4.25 MHz best frq. = 50 kHz, Compare with e _{DB} , e _{DR}
9	Residual Carrier Level	e _{car}	1	-	100	200	mV _{p-p}	e12 = e15 = 200 mV _{p-p} , f12 = f15 = 4.25 MHz
10	Maximum Color Differential Output	e _{OM}	1	4.5	5.7	-	V _{p-p}	Set e _{DB} = e _{DR} = 1 V _{p-p} (±0.5 V _{p-p}) by f12, f15, Color max.
11	(B-Y), (R-Y) Color Differential Output	e _{OB} , e _{OR}	1	2.0	3.0	4.0	V _{p-p}	Same as No. 10 Color typ.
12	Demodulator (G-Y)/(B-Y) Ratio	G/B	1	0.17	0.19	0.21	times	Same as No. 11, e _{DR} = 0 V _{p-p}
13	Demodulator (G-Y)/(R-Y) Ratio	G/R	1	0.46	0.51	0.56	times	Same as No. 11, e _{DB} = 0 V _{p-p}
14	Maximum Color Gain	A _{CR} , A _{CB}	1	17	19	21	dB	Set e _{DB} = e _{DR} = 0.3 V _{p-p} by f12, f15 Color max.
15	Color Gain Relative Ratio	A _{CR} /A _{CB}	1	-	0	±7	%	Same as No. 14
16	Contrast Cont. Range	e _{OC}	1	15	17	19	dB	Contrast max. to min., Color typ. Set e _{OB} = e _{OR} = 1 V _{p-p} by f12, f15 at Contrast max.
17	Residual Color Level (Killer on)	e _{OK}	1	-	-	30	mV _{p-p}	Set e _{OB} = e _{OR} = 1 V _{p-p} by f12, f15, at Killer off, Killer on
18	DC Output Voltage	E _o	1	2.7	3.5	4.3	V	No Input Signal, Killer on, V2 = 10.3 V
19	DC Output Difference Voltage	E _{x-y}	1	-200	0	200	mV	No Input Signal, Killer on, V3 = 3.5 V
20	E _o Temperature Coefficient	ΔE _o /ΔT	1	-2	0	+2	mV/°C	V3 = 3.5 V at Ta = 25 °C, Ta = -20 to +70 °C
21	E _{x-y} Temperature Coefficient	ΔE _{x-y} (T)	1	-	0	±60	mV	Same as No. 20
22	E _{x-y} Supply Voltage Coefficient	ΔE _{x-y} (V)	1	-	0	±60	mV	V3 = 3.5 V at V _{CC} = 12 V, V _{CC} = 12 V ± 20 %
23	Y Amp. Voltage Gain	A _y	1	4.3	4.8	5.3	times	e _y = 0.5 V _{p-p} , f = 10 kHz, V3 = 3.5 V, Killer on
24	Y Amp. Frequency Characteristic	f _y	1	5	6	-	MHz	e _y = 0.5 V _{p-p} , 0 dB = A _y , -3 dB
25	Over all Color Differential Output Voltage	e _{OT}	2	2.5	3.6	5.0	V _{p-p}	e _{in} = 200 mV _{p-p} , Color bar Signal, Color typ., Contrast max., B Output
26	Killer Sensitivity	e _k	2	28	34	40	dB	0 dB = e _{in} 200 mV _{p-p} , Color bar Signal, Attenuator Level at Killer on
27	White Balance Changing Level By Input	ΔE _{x-y} (IN)	2	-	-	±60	mV	e _{in} = 20 to 400 mV _{p-p} , White Signal
28	White Balance Changing Level By Color Cont.	ΔE _{x-y} (Color)	2	-	-	±60	mV	e _{in} = 200 mV _{p-p} , White Signal, Contrast max., Color max. to min.

NO	CHARACTERISTIC	SYMBOL	TEST CKT	MIN.	TYP.	MAX.	UNIT	TEST CONDITION
29	White Balance Changing Level by Contrast Cont	ΔE_{x-y} (Contrast)	2		0	± 60	mV	$E_{in} = 200 \text{ mV}_{p-p}$, White Signal, Color typ., Contrast max. to min.
30	Pin 15 Input Impedance	R_{i15} C_{i15}	3	2.8 4.5	4 6.6	5.6 9.5	k Ω pF	$f = 4.4 \text{ MHz}$, 100 mV_{p-p}
31	Pin 12 Input Impedance	R_{i12} C_{i12}	3	2.8 3.7	4 5.5	5.6 8.0	k Ω pF	$f = 4.4 \text{ MHz}$, 100 mV_{p-p}
32	Pin 10 Input Impedance	R_{i10} C_{i10}	3		17 15		k Ω pF	Same as No. 31
33	Pin 20 Input Impedance	R_{i20} C_{i20}	3		17 15		k Ω pF	Same as No. 31
34	Pin 23, 24 Input Impedance	$R_{i23, 24}$ $C_{i23, 24}$	3		25 13		k Ω pF	Same as No. 31
35	Pin 17 Output Resistance	R_{o17}	—	120	180	270	Ω	
36	Pin 9, 21 Output Resistance	$R_{o9, 21}$	—	4.0	6.0	8.0	k Ω	
37	Minimum Gate Pulse Voltage	V_C (min)				1.5	V	
38	Minimum Trigger Pulse Voltage	V_{FF}				1.5	V	
39	Minimum Blanking Pulse Voltage	V_{BLK}			—	2.0	V	

TEST CIRCUIT 1



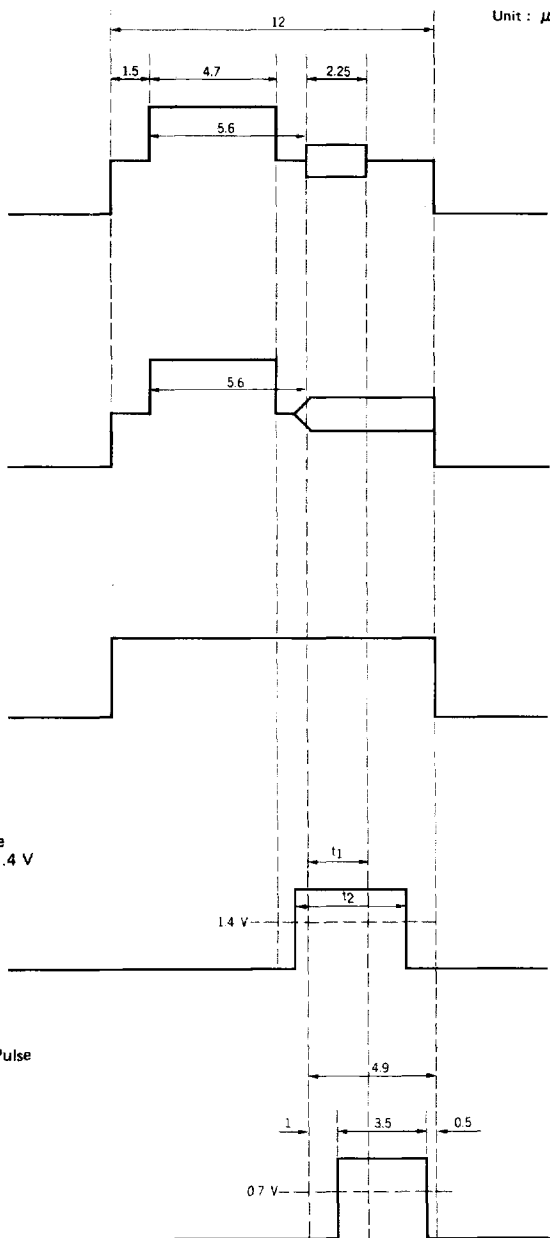
No.	SYMBOL	Test Circuit	S1 Power	S2 Video Input	S3 LFP	SA RGB	SB Detect	SC Color Input	SD Line Input	SE Contrast	SF Detect	S7 Color Killer	VDS Video-DC Input	VAS Contrast Limited	VBS Color Control	Input level and etc.	Measuring point and instrument
1	10C	1	OFF-ON	OFF	ON	R	OFF	15 ON	MAX	OFF	OFF	ON	V ₃ = 3.5 V	-	-	E ₁₅ = 0 mV _{p-p}	Pin 1 (DC Ammeter)
2	V11	1	OFF-ON	OFF	ON	R	OFF	15 ON	MAX	OFF	OFF	ON	V ₃ = 3.5 V	-	-	E ₁₅ = 0 mV _{p-p}	Pin 11 (Digital Voltmeter)
3	V17	1	OFF-ON	OFF	ON	R	OFF	15 ON	MAX	OFF	OFF	ON	V ₃ = 3.5 V	-	-	E ₁₅ = 0 mV _{p-p}	Pin 17 (Digital Voltmeter)
4	V17K	1	OFF-ON	OFF	ON	R	OFF	15 ON	MAX	OFF	OFF	ON	V ₃ = 3.5 V	-	-	E ₁₅ = 0 mV _{p-p}	Pin 17 (Digital Voltmeter)
5	EDB·BOR	1	OFF-ON	OFF	ON	R	OFF	15 ON	MAX	OFF	OFF	ON	V ₃ = 3.5 V	-	-	E ₁₅ = 200 mV _{p-p} (4.48 MHz) E ₁₇ = 200 mV _{p-p} (4.02 MHz)	EDB·BOR Output (Oscilloscope)
6	EL	1	OFF-ON	OFF	ON	R	OFF	15 OFF	MAX	OFF	OFF	ON	V ₃ = 3.5 V	-	-	E ₁₅ = 200 mV _{p-p} (4.25 MHz, Δf = 1.200 kHz) E ₁₇ = 0 mV _{p-p}	E ₁₅ input level providing -3 dB (Oscilloscope)
7	AMR	1	OFF-ON	OFF	ON	R	OFF	15 OFF	MAX	OFF	OFF	ON	V ₃ = 3.5 V	-	-	E ₁₅ = 200 mV _{p-p} (4.25 MHz, AM 30% MOD, f _m = 1 kHz) E ₁₇ = 0 mV _{p-p}	Calculate ratio of values of E ₁₅ and E ₁₇ (Oscilloscope)
8	CT	1	OFF-ON	OFF	ON	R	OFF	15 OFF	MAX	OFF	OFF	ON	V ₃ = 3.5 V	-	-	E ₁₅ = 200 mV _{p-p} (4.25 MHz) E ₁₇ = 200 mV _{p-p} (4.30 MHz)	Calculate ratio among the bear output of EDB, BOR, and No.5 values (Oscilloscope)
9	E _{car}	1	OFF-ON	OFF	OFF	RGB	OFF	12 ON	MAX	OFF	OFF	ON	V ₃ = 3.5 V	-	-	E ₁₅ = 200 mV _{p-p} (4.25 MHz) E ₁₇ = 200 mV _{p-p} (4.25 MHz)	Remain carrier level of E _{car} (tracing period) (Oscilloscope)
10	θOM	1	OFF-ON	OFF	ON	RB	OFF	15 ON	MAX	OFF	OFF	ON	V ₃ = 3.5 V	-	-	Set EDB = BOR = 1 V _{p-p} E ₁₅ = 200 mV _{p-p} (roughly 4.48 MHz) E ₁₇ = 200 mV _{p-p} (roughly 4.02 MHz)	E ₁₅ output (Oscilloscope)
11	EDB·BOR	1	OFF-ON	OFF	ON	RB	OFF	15 ON	MAX	OFF	OFF	ON	V ₃ = 3.5 V	-	-	Set EDB = BOR = 1 V _{p-p} E ₁₅ = 200 mV _{p-p} (roughly 4.48 MHz) E ₁₇ = 200 mV _{p-p} (roughly 4.02 MHz)	E ₁₇ output (Oscilloscope)
12	G _B	1	OFF-ON	OFF	ON	GB	ON	15 ON	MAX	OFF	OFF	ON	V ₃ = 3.5 V	-	-	Set EDB = BOR = 1 V _{p-p} E ₁₅ = 200 mV _{p-p} (roughly 4.48 MHz) E ₁₇ = 200 mV _{p-p} (roughly 4.02 MHz)	E ₁₅ Output (Oscilloscope)
13	G _R	1	OFF-ON	OFF	ON	RG	OFF	15 ON	MAX	OFF	OFF	ON	V ₃ = 3.5 V	-	-	Set EDB = BOR = 1 V _{p-p} E ₁₅ = 200 mV _{p-p} (roughly 4.48 MHz) E ₁₇ = 200 mV _{p-p} (roughly 4.02 MHz)	E ₁₅ Output (Oscilloscope)
14	ACR ₁ ·ACB	1	OFF-ON	OFF	ON	RB	OFF	15 ON	MAX	OFF	OFF	ON	V ₃ = 3.5 V	-	-	Set EDB = BOR = 1 V _{p-p} E ₁₅ = 200 mV _{p-p} (roughly 4.48 MHz) E ₁₇ = 200 mV _{p-p} (roughly 4.02 MHz)	E ₁₅ Output (Oscilloscope)
15	ACR ₁ ·ACB	1	OFF-ON	OFF	ON	RB	OFF	15 ON	MAX	OFF	OFF	ON	V ₃ = 3.5 V	-	-	Set EDB = BOR = 0.3 V _{p-p} E ₁₅ = 200 mV _{p-p} (roughly 4.32 MHz) E ₁₇ = 200 mV _{p-p} (roughly 4.18 MHz)	Calculate ratio among ACR and ACB of No. 5

No.	SYMBOL	Test Circuit	S1 Power	S2 Video Input	S3 LPE	S4 RGB	S5 A-Y Detect	S9 A-Y Detect	S15 Chromie Input	S16 Limit Pulse Input	S19 Contrast	S21 B-Y Detect	S22 Color	S25 Reset	S27 Color Killer	VR2 Video DC Input	VR19 Contrast Limit	VR22 Color Control	Input level and etc.	Measuring point and instrument
16	E _{OC}	1	OFF-ON	OFF	ON	RB	OFF	15	ON	MAX	MAX	OFF	TYP	OFF	OFF	V ₃ = 3.5 V	-	-	Color ratio of R, G and B against V _{CC} (Digital voltmeter) Color ratio of G and B against contrast (Oscilloscope)	
17	E _{OK}	1	OFF-ON	OFF	ON	RB	OFF	15	ON	MAX	MAX	OFF	TYP	OFF	ON	V ₃ = 3.5 V	-	-	Color killer ON Color killer OFF	
18	E ₀	1	OFF-ON	OFF	ON	RGB	OFF	15	ON	MAX	MAX	OFF	TYP	OFF	ON	V ₂ = 10.3 V	-	-	E ₀ DC output voltage (Digital voltmeter)	
19	E _{x-y}	1	OFF-ON	OFF	ON	RGB	OFF	15	ON	MAX	MAX	OFF	TYP	OFF	ON	V ₃ = 3.5 V	-	-	Difference among two values of RGB output DC voltage of No. 18 (Digital voltmeter)	
20	ΔE _{z/AT}	1	OFF-ON	OFF	ON	RGB	OFF	15	ON	MAX	MAX	OFF	TYP	OFF	ON	V ₃ = 3.5 V	-	-	E _z DC output voltage Calculate temperature against E _z (Digital voltmeter)	
21	ΔE _{x-y(T)}	1	OFF-ON	OFF	ON	RGB	OFF	15	ON	MAX	MAX	OFF	TYP	OFF	ON	V ₃ = 3.5 V	-	-	E _z DC output voltage Maximum change of E _{x-y} against T _a (Digital voltmeter)	
22	ΔE _{x-y(V)}	1	OFF-ON	OFF	ON	RGB	OFF	15	ON	MAX	MAX	OFF	TYP	OFF	ON	V ₃ = 3.5 V	-	-	E _z DC output voltage Maximum change of E _{x-y} against V _{CC} (Digital voltmeter)	
23	A _y	1	OFF-ON	ON	OFF	RGB	OFF	15	ON	MAX	MAX	OFF	TYP	OFF	ON	V ₃ = 3.5 V	-	-	E _{g2} (AC voltmeter) Calculate gain in case of input level 10.5 V _{p-p}	
24	I _y	1	OFF-ON	ON	OFF	RGB	OFF	15	ON	MAX	MAX	OFF	TYP	OFF	ON	V ₃ = 3.5 V	-	-	Input frequency (frequency counter) in case of A _y is -3 dB of No. 23	
25	E _{OT}	2	OFF-ON	-	-	-	-	-	-	-	-	-	-	-	-	V ₃ = 3.5 V	MAX	TYP	B output (Oscilloscope)	
26	E _k	2	OFF-ON	-	-	-	-	-	-	-	-	-	-	-	-	V ₃ = 3.5 V	MAX	TYP	Color killer ON V ₁₂ > 11 V (Digital voltmeter) Attenuation (Attenuator) SECAM input signal level	
27	ΔE _{x-y(N)}	2	OFF-ON	-	-	-	-	-	-	-	-	-	-	-	-	V ₃ = 3.5 V	MAX	TYP	Difference among RGB (Digital voltmeter) Maximum change of E _{x-y} between 20 and 400 mV _{p-p} of input level	
28	ΔE _{x-y(Contr)}	2	OFF-ON	-	-	-	-	-	-	-	-	-	-	-	-	V ₃ = 3.5 V	MAX	MAX	Difference among RGB (Digital voltmeter) Maximum change of E _{x-y} between MIN and MAX of Color Control	
29	ΔE _{x-y(Contr)}	2	OFF-ON	-	-	-	-	-	-	-	-	-	-	-	-	V ₃ = 3.5 V	MAX	TYP	Difference among RGB (Digital voltmeter) Maximum change of E _{x-y} between MIN and MAX of Contrast Control	

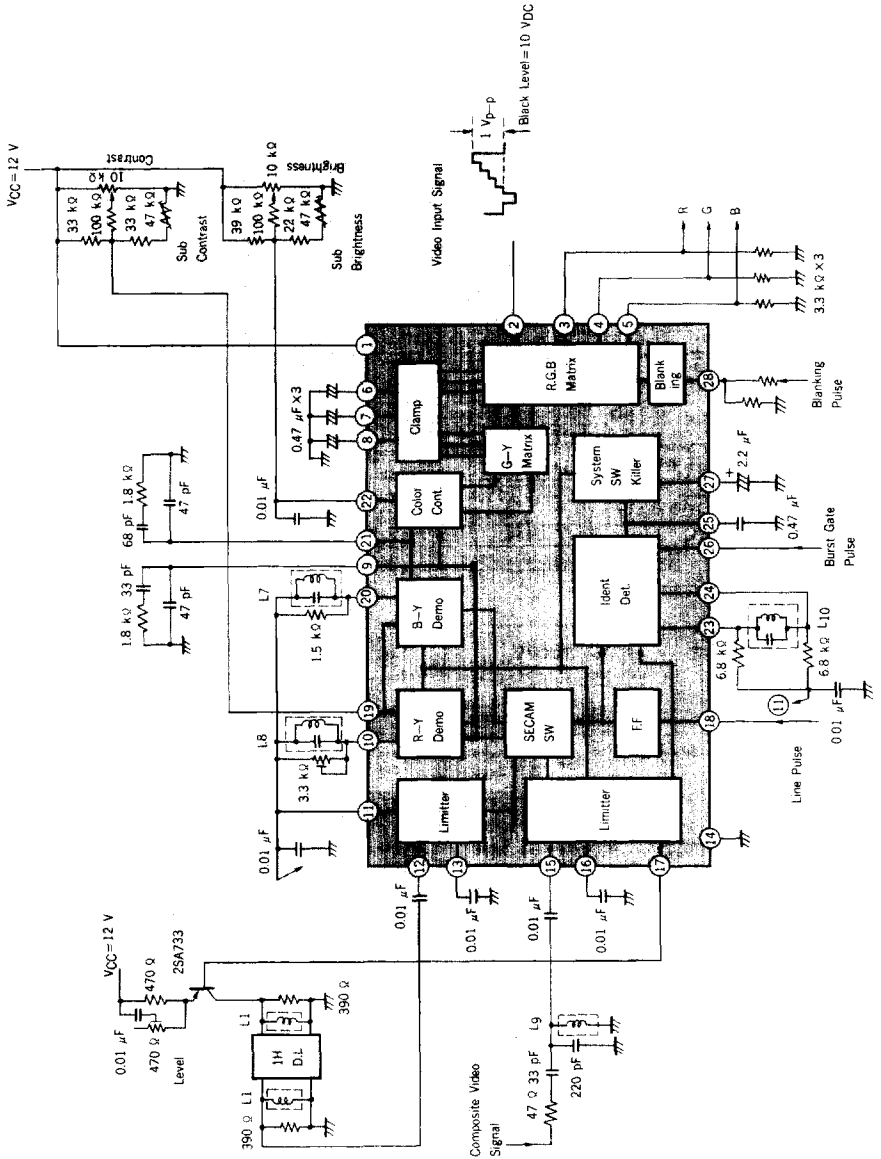
μPC1364C (SECAM), μPC1365C (PAL) INPUT SIGNAL AND PULSE TIME RELATION

PAL Burst Signal

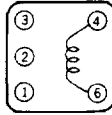
Unit : μs



μPC1364C2

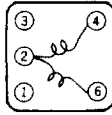


L1 1H D.L. Matching
Input Coil
(PAL, SECAM)



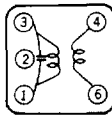
Type No. TKRNS - 24984NK (Pink Core)
Toko Corp.
fo : 4.43 MHz
6 - 4 : 18 T
C out : 330 pF (4 - 6)
Qu : 59 ± 20 %
Wire Material : 0.1/UEW

L2 1H D.L. Matching
Output Coil
(PAL, SECAM)



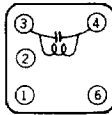
Type No. TKRNS - 24985VN (Black Core)
Toko Corp.
fo : 4.43 MHz
4 - 2 : 18 T
2 - 6 : 18 T
C out : 75 pF (4 - 6)
Qu : 44 ± 20 %
Wire Material : 0.1/UEW

L3 Chroma Input Coil
(PAL)



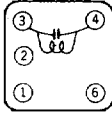
Type No. 163NEF - 1148 WWJ (No Core)
Toko Corp.
fo : 4.43 MHz
6 - 4 : 35 1/2 T
3 - 1 : 76 T
C in : 47 pF
Wire Material : 0.1/UEW

L7 (B-Y) Demodulator
(SECAM)



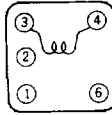
Type No. TKRES - 25656AYC (Yellow Core)
Toko Corp.
fo : 4.25 MHz
3 - 4 : 33 1/2 T
C in : 82 pF (3 - 4)
Qu : 75 ± 20 %
Wire Material : 0.1/OU EW

L8 (R-Y) Demodulator
(SECAM)



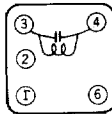
Type No. TKRES - 25658AYK (Green Core)
Toko Corp.
fo : 4.406 MHz
3 - 4 ; 32 1/2 T
C in ; 82 pF
Qu ; 75 ± 20 %
Wire Material ; 0.1/OUEW

L9 Bell Filter
(SECAM)



Type No. TKRNS - 25657AYC (Red Core)
Toko Corp.
3 - 4 ; 19 1/2 T
C out ; 220 pF
Qu ; 70 ± 20 %
Wire Material ; 0.12/OUEW

L10 Ident Detector



Type No. TKRES - 25659AYC (Orange Core)
Toko Corp.
fo : 4.406 MHz
3 - 4 ; 39 1/2 T
C in ; 68 pF
Qu ; 63 ± 20 %
Wire Material ; 0.1/OUEW