BIPOLAR ANALOG INTEGRATED CIRCUIT

μPC1377C

SYNCHRONIZATION SIGNAL PROCESSOR OF COLOR TV

DESCRIPTION

The μPC1377C is a silicon monolithic integrated circuit designed for horizontal deflection circuit and vertical deflection circuit of color TV set.

It consists two synchronization signal separators, vertical oscillator, vertical saw tooth shaper, vertical pre-drive, vertical retrace blanking pulse generator, horizontal AFC, horizontal oscillator, horizontal pre-driver and abnormal high voltage prevention circuit, in it.
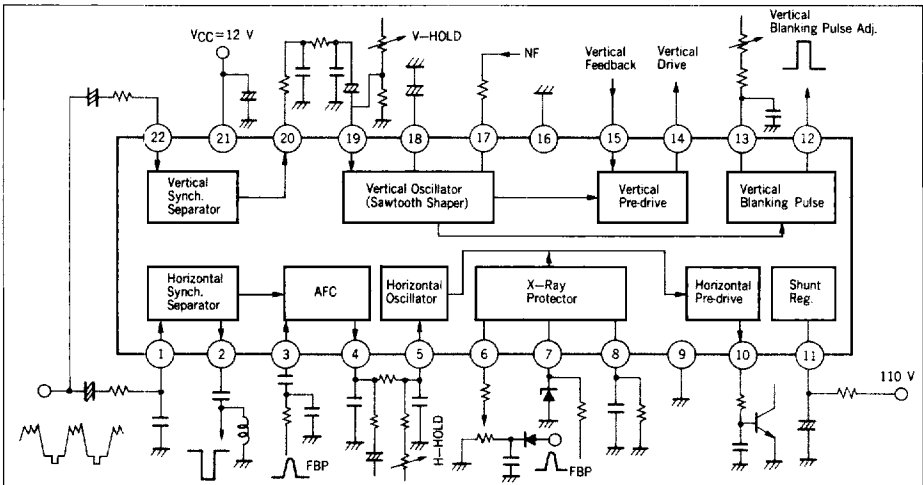
The horizontal part can take the operation current from high +B line as it has a shunt type regulator in it.

The synchronization signal separators are provided for horizontal signal and vertical one independently, so it works very stable even in the ghost phenomenon, weak electrical field and etc.
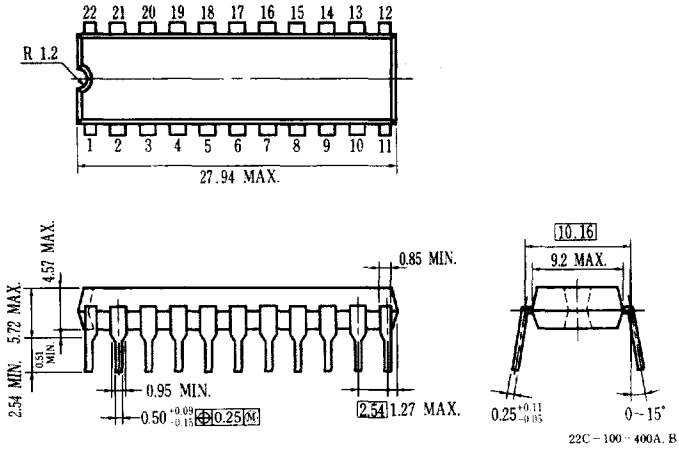
FEATURES

- Provided two synchronous signal separators realizes very stable synchronization, as they are provided each of horizontal signal and vertical one independently.
- Remarkably improved interlace tracking brought by the completely separated wiring in horizontal part and vertical one.
- Vertical retrace blanking time can be set freely and strictly by the adjust terminal.
- Very low drift of oscillation frequency of vertical oscillator and horizontal one against ambient temperature.
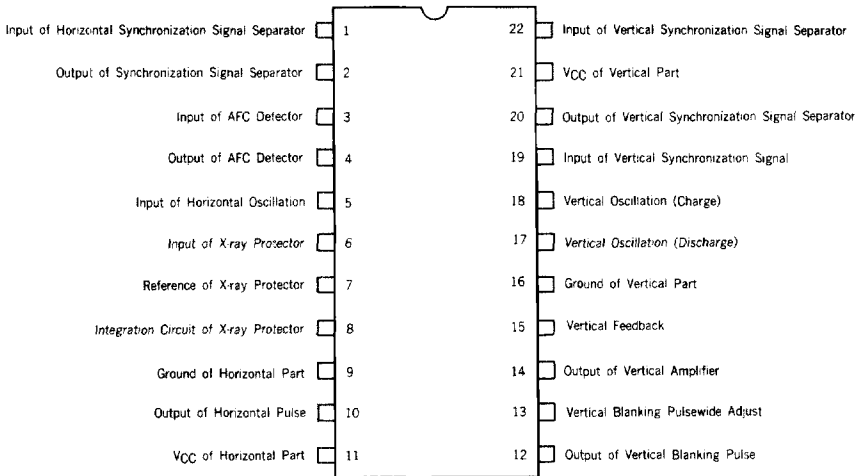
BLOCK DIAGRAM

PACKAGE DIMENSIONS (Unit : mm)

22 PIN PLASTIC DIP (400 mil)

R 1.2

22 21 20 19 18 17 16 15 14 13 12

1 2 3 4 5 6 7 8 9 10 11

27.94 MAX.

4.57 MAX.

5.72 MAX.

2.54 MIN.

0.51 MIN.

0.85 MIN.

0.95 MIN.

0.50 +0.09 −0.15 ⊕ 0.25 Ⓜ

2.54 1.27 MAX.

10.16

9.2 MAX.

0.25 +0.11 −0.05

0 ~ 15°

22C − 100 − 400A, B

CONNECTION DIAGRAM (Top View)

Pin	Left		Right	Pin
1	Input of Horizontal Synchronization Signal Separator		Input of Vertical Synchronization Signal Separator	22
2	Output of Synchronization Signal Separator		V$_{CC}$ of Vertical Part	21
3	Input of AFC Detector		Output of Vertical Synchronization Signal Separator	20
4	Output of AFC Detector		Input of Vertical Synchronization Signal	19
5	Input of Horizontal Oscillation		Vertical Oscillation (Charge)	18
6	Input of X-ray Protector		Vertical Oscillation (Discharge)	17
7	Reference of X-ray Protector		Ground of Vertical Part	16
8	Integration Circuit of X-ray Protector		Vertical Feedback	15
9	Ground of Horizontal Part		Output of Vertical Amplifier	14
10	Output of Horizontal Pulse		Vertical Blanking Pulsewide Adjust	13
11	V$_{CC}$ of Horizontal Part		Output of Vertical Blanking Pulse	12

Mark (+) of current expresses that the current is flowing into the terminal. Mark (-) of current expresses that the current is flowing out from the terminal.

ABSOLUTE MAXIMUM RATINGS (T_a=25 ± 3 °C)

Power Supply Voltage for Vertical Part	V_{21}	15		V
Power Supply Current Drain for Horizontal Part	V_{11}	30		mA
Vertical Output Current	I_{14}	-30 to +0		mA
Horizontal Output Current	I_{10}	-10 to +10		mA
Power Dissipation	P_D	600	(T_a=75 °C)	mW
Operating Temperature	T_{opt}	-20 to +75		°C
Storage Temperature	T_{stg}	-40 to +125		°C

RECOMMENDED CONDITIONS (T_a=25 °C)

Power Supply Voltage for Vertical Part	V_{21}	12	V
Power Supply Current Drain for Horizontal Part	I_{11}	15	mA

ELECTRICAL CHARACTERISTICS (T_a=25 °C)

(V_{21} = 12 V, I_{11} = 15 mA, Standard Circuit)

CHARACTERISTICS	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS
Power Supply Current for Vertical Part	I_{21}	10.5	14	17.5	mA	V_{21}=12 V
Power Supply Voltage for Horizontal Part	V_{11}	12.0	13.0	14.5	V	I_{11}=15 mA
Vertical Free-running Frequency	f_{vo}	48	50	53	Hz	C_{18}≈1 μF, R_{17}=33 kΩ
Drift of Vertical Free-running Frequency	$\Delta f_{vo}(V_{CC})$	0	0.8	1.0	Hz	$\Delta f_{vo}(V_{CC})$=$\vert f_{vo}$(9.6 V)-f_{vo}(14.4 V)$\vert$
Drift of Vertical Free-running Frequency	$\Delta f_{vo}(T_a)$	0	0.6	1.0	Hz	$\Delta f_{vo}(T_a)$=$\vert f_{vo}$(-20 °C)-f_{vo}(+75 °C)$\vert$
Vertical Synchronizing Capture Frequency	f_{pv}	46	48	50	Hz	
Output Middle Voltage	V_{MID}	12	13	14	V	Output Power: μPC1378H
Drift of Output Middle Voltage	$\Delta V_{MID}(T_a)$	0		1.0	V	$\Delta V_{MID}(T_a)$=$\vert V_{MID}$(-20 °C)-V_{MID}(+75 °C)$\vert$
Retrace Pulse Width (1)	RPW(1)	0.95	1.0	1.05	ms	C_{13}≈0.047 μF, R_{13}=30.75 kΩ
Retrace Pulse Width (2)	RPW(2)	1.9	2.0	2.1	ms	C_{13}≈0.1 μF, R_{13}=28.5 kΩ
Retrace Pulse Voltage	RPV	10	11		V_{p-p}	
Drift of Horizontal Power Supply Voltage	$\Delta V_{11}(T_a)$			130	mV	$\Delta V_{11}(T_a)$=$\vert V_{11}$(-20 °C)-ΔV_{11}(+75 °C)$\vert$
Horizontal Synchronizing Capture Frequency	f_{pH}	±500	±700	±900	Hz	C_5=5 600 pF
Efficiency of Horizontal Oscillation Control	β	38	40	45	Hz/μA	
Gain of AFC Detector	μ	190	300	420	μA/rad	
Horizontal Free-running Frequency	f_{HO}	15.00	15.75	16.50	kHz	C_5=5 600 pF, R_5=14.5 kΩ
Drift of Horizontal Free-running Frequency	$\Delta f_{HO}(I_{11})$	0		50	Hz	$\Delta f_{HO}(I_{11})$=$\vert f_{HO}$(15 mA)-f_{HO}(9 mA)$\vert$
Drift of Horizontal Free-running Frequency	$\Delta f_{HO}(T_a)$	0	40	100	Hz	$\Delta f_{HO}(T_a)$=$\vert f_{HO}$(-20 °C)-f_{HO}(+75 °C)$\vert$
Horizontal Output Pulse Width	PWH	24.5	26	27.5	μs	
Horizontal Output Pulse Voltage	PWV	10	11		V_{p-p}	
Horizontal Output Current	I_{10}	-3.5	-4.5	-6.0	mA	
Input Voltage of X-ray Protector	V_6	-0.1		0.1	V	V_7 = 6.2 V

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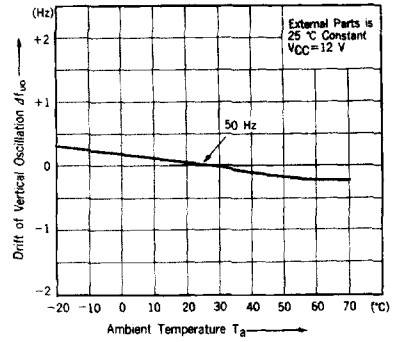## TYPICAL CHARACTERISTICS ($T_a = 25$ °C)

1. Vertical part

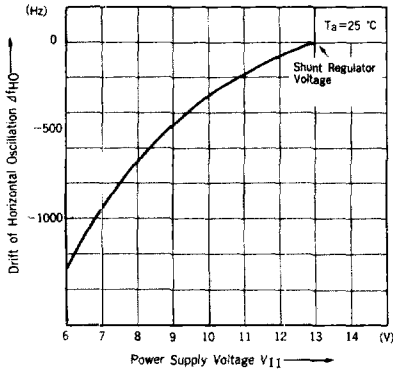**DRIFT OF VERTICAL OSCILLATION AGAINST POWER SUPPLY VOLTAGE**

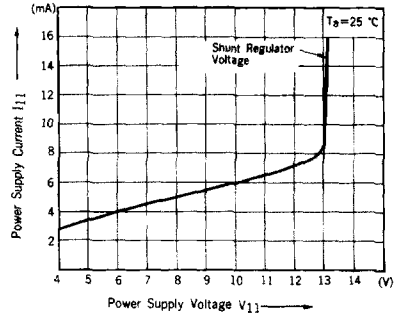**DRIFT OF VERTICAL OSCILLATION AGAINST AMBIENT TEMPERATURE**
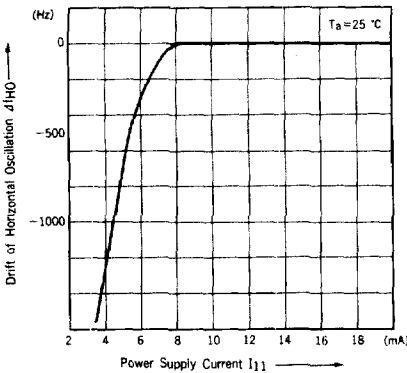

2. Horizontal part

DRIFT OF HORIZONTAL OSCILLATION AGAINST POWER SUPPLY CURRENT

POWER SUPPLY CURRENT vs. POWER SUPPLY VOLTAGE

DRIFT OF HORIZONTAL OSCILLATION AGAINST POWER SUPPLY VOLTAGE

DRIFT OF HORIZONTAL OSCILLATION AGAINST TEMPERATURE

TYPICAL APPLICATIONS