

BIPOLAR ANALOG INTEGRATED CIRCUIT

μ PC1377C

SYNCHRONIZATION SIGNAL PROCESSOR OF COLOR TV

DESCRIPTION

The μ PC1377C 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.

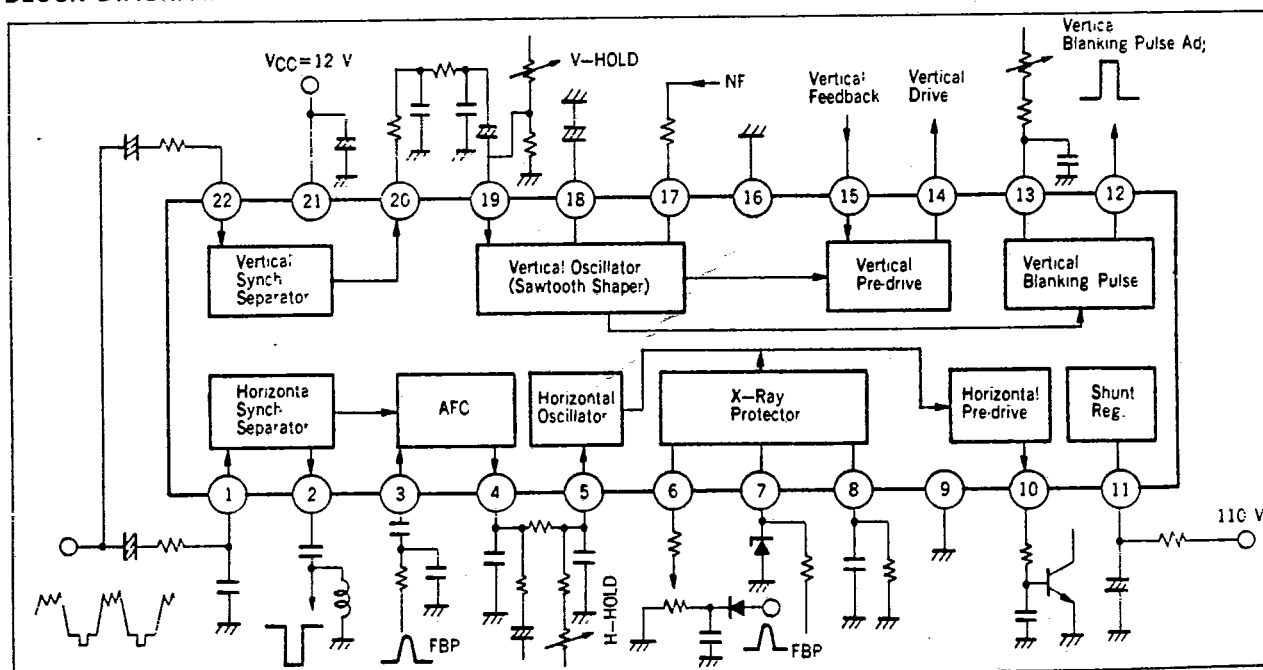
The horizontal part can take the operation current from high +B line as it has a shunt type regulator in it.

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

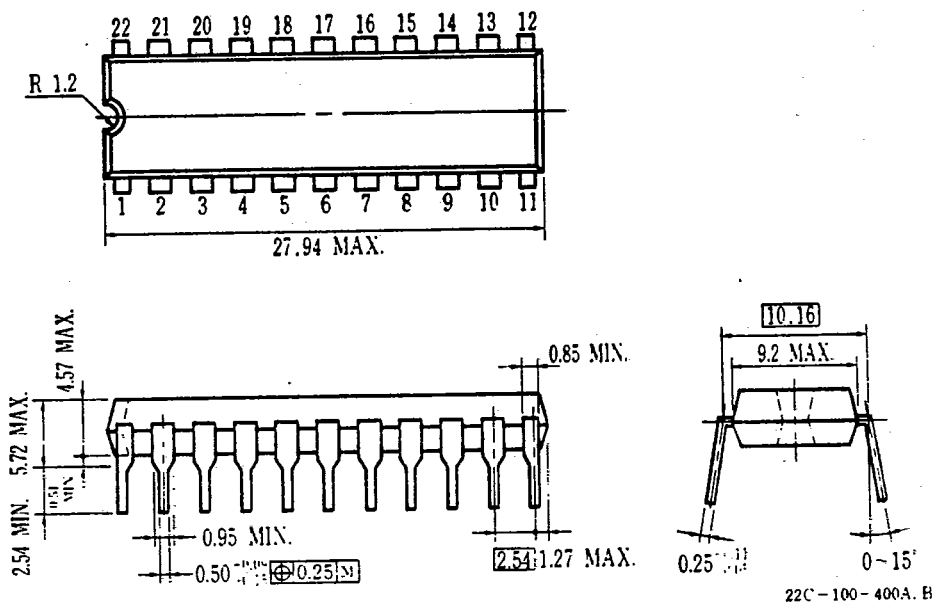
- Provided two synchronous signal separators realizes very stable synchronization, as they are provided each of horizontal signal and vertical one independently.
- Remarkably improved interlace tracking brought by the completely separated wiring in horizontal part and vertical one.
- Vertical retrace 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

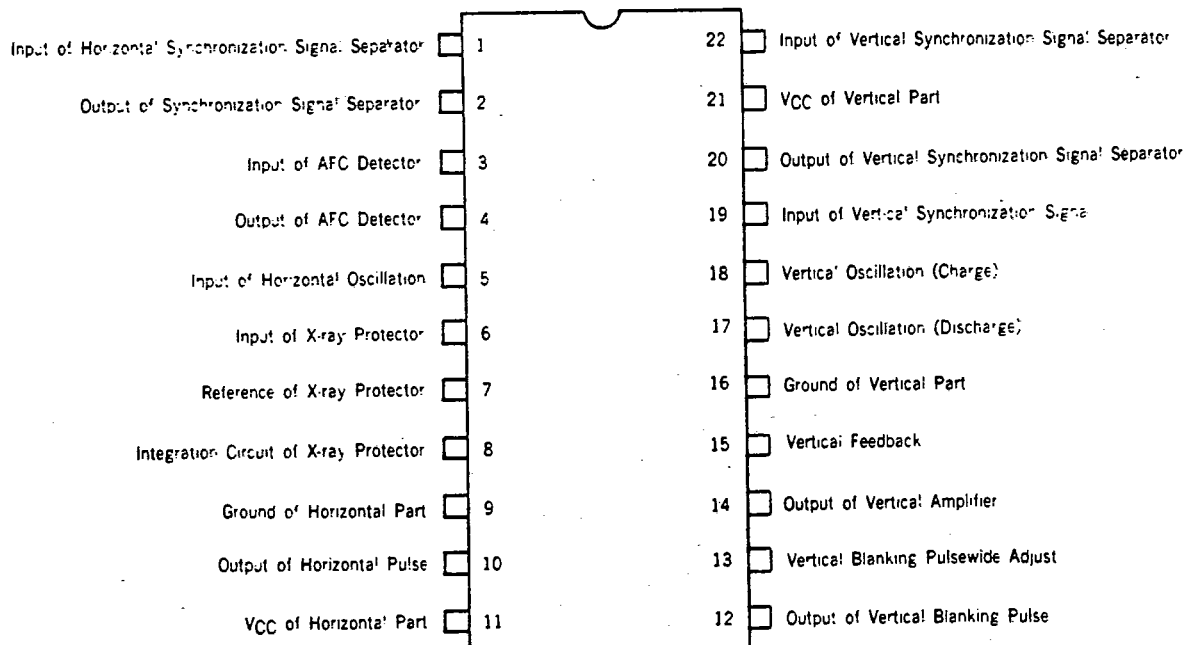


PACKAGE DIMENSIONS (Unit : mm)

22 PIN PLASTIC DIP (400 mil)



CONNECTION DIAGRAM (Top View)



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 ($T_a = 25 \pm 3^\circ\text{C}$)

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 ($T_a = 75^\circ\text{C}$)	mW
Operating Temperature	T_{opt}	-20 to +75	$^\circ\text{C}$
Storage Temperature	T_{stg}	-40 to +125	$^\circ\text{C}$

RECOMMENDED CONDITIONS ($T_a = 25^\circ\text{C}$)

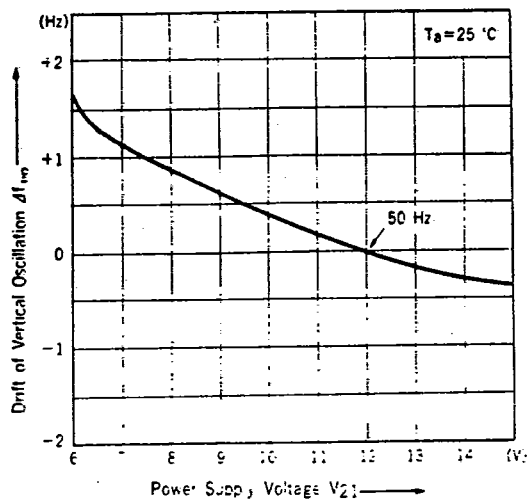
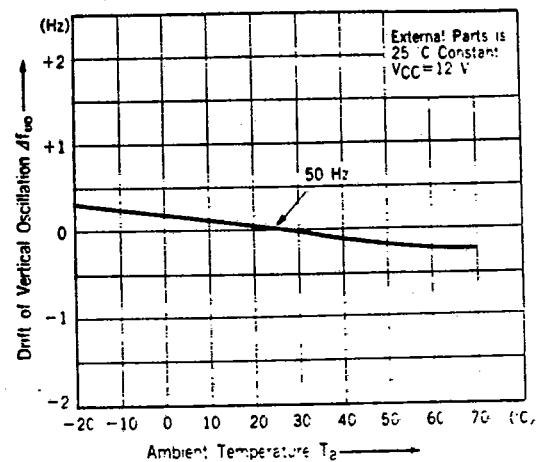
Power Supply Voltage for Vertical Part	V_{21}	12	V
Power Supply Current Drain for Horizontal Part	I_{11}	15	mA

ELECTRICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$)(V₂₁ = 12 V, I₁₁ = 15 mA, Standard Circuit)

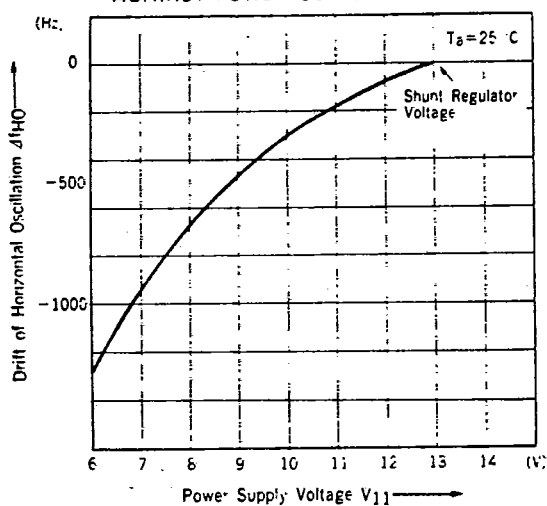
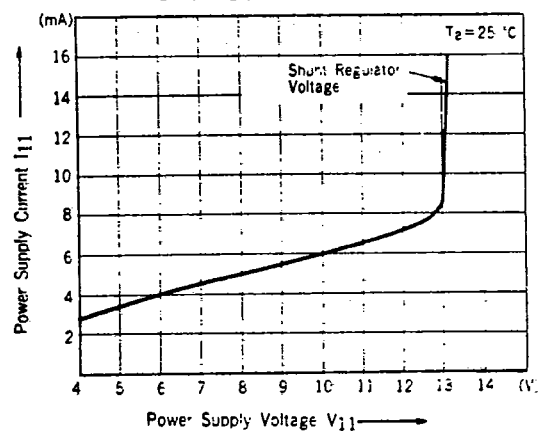
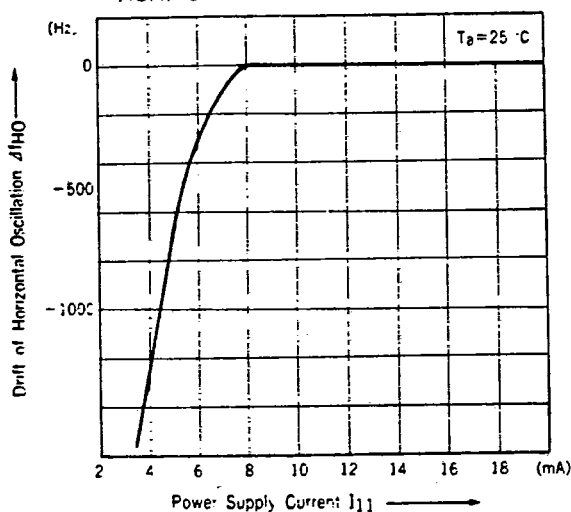
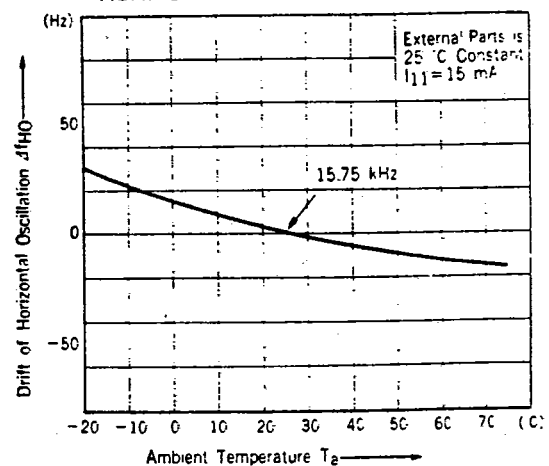
CHARACTERISTICS	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS
Power Supply Current for Vertical Part	I_{21}	10.5	14	17.5	mA	$V_{21}=12\text{ V}$
Power Supply Voltage for Horizontal Part	V_{11}	12.0	13.0	14.5	V	$I_{11}=15\text{ mA}$
Vertical Free-running Frequency	f_{vo}	48	50	53	Hz	$C_{18}=1\text{ }\mu\text{F}$, $R_{17}=33\text{ k}\Omega$
Drift of Vertical Free-running Frequency	$\Delta f_{vo}(V_{CC})$	0	0.8	1.0	Hz	$\Delta f_{vo}(V_{CC})=f_{vo}(9.6\text{ V})-f_{vo}(14.4\text{ V})$
Drift of Vertical Free-running Frequency	$\Delta f_{vo}(T_a)$	0	0.6	1.0	Hz	$\Delta f_{vo}(T_a)=f_{vo}(-20^\circ\text{C})-f_{vo}(+75^\circ\text{C})$
Vertical Synchronizing Capture Frequency	f_{pv}	46	48	50	Hz	
Output Middle Voltage	V_{MID}	12	13	14	V	Output Power: $\mu\text{PC1378H}$
Drift of Output Middle Voltage	$\Delta V_{MID}(T_a)$	0		1.0	V	$\Delta V_{MID}(T_a)=V_{MID}(-20^\circ\text{C})-V_{MID}(+75^\circ\text{C})$
Retrace Pulse Width (1)	$RPW(1)$	0.95	1.0	1.05	ms	$C_{13}=0.047\text{ }\mu\text{F}$, $R_{13}=30.75\text{ k}\Omega$
Retrace Pulse Width (2)	$RPW(2)$	1.9	2.0	2.1	ms	$C_{13}=0.1\text{ }\mu\text{F}$, $R_{13}=28.5\text{ k}\Omega$
Retrace Pulse Voltage	RPV	10	11		V _{p-p}	
Drift of Horizontal Power Supply Voltage	$\Delta V_{11}(T_a)$			130	mV	$\Delta V_{11}(T_a)=V_{11}(-20^\circ\text{C})-V_{11}(+75^\circ\text{C})$
Horizontal Synchronizing Capture Frequency	f_{ph}	± 500	± 700	± 900	Hz	$C_5=5\text{ }600\text{ pF}$
Efficiency of Horizontal Oscillation Control	β	38	40	45	Hz/ μA	
Gain of AFC Detector	μ	190	300	420	$\mu\text{A/rad}$	
Horizontal Free-running Frequency	f_{HO}	15.00	15.75	16.50	kHz	$C_5=5\text{ }600\text{ pF}$, $R_5=14.5\text{ k}\Omega$
Drift of Horizontal Free-running Frequency	$\Delta f_{HO}(I_{11})$	0		50	Hz	$\Delta f_{HO}(I_{11})=f_{HO}(15\text{ mA})-f_{HO}(9\text{ mA})$
Drift of Horizontal Free-running Frequency	$\Delta f_{HO}(T_a)$	0	40	100	Hz	$\Delta f_{HO}(T_a)=f_{HO}(-20^\circ\text{C})-f_{HO}(+75^\circ\text{C})$
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	$V_7 = 6.2\text{ V}$

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

1. Vertical part

DRIFT OF VERTICAL OSCILLATION
AGAINST POWER SUPPLY VOLTAGEDRIFT OF VERTICAL OSCILLATION
AGAINST AMBIENT TEMPERATURE

2. Horizontal part

DRIFT OF HORIZONTAL OSCILLATION
AGAINST POWER SUPPLY CURRENTPOWER SUPPLY CURRENT vs.
POWER SUPPLY VOLTAGEDRIFT OF HORIZONTAL OSCILLATION
AGAINST POWER SUPPLY VOLTAGEDRIFT OF HORIZONTAL OSCILLATION
AGAINST TEMPERATURE

μPC1377C

μPC1378H

The schematic diagram illustrates the internal circuitry of two integrated circuits, **μPC1377C** and **μPC1378H**, used in a video display system.

μPC1377C Section:

- Vertical Sync Separator:** Receives input from pin 21 (VCC1 = 12 V) and outputs to pin 20 (0 V).
- Horizontal Sync Separator:** Receives input from pin 22 (VCC1 = 12 V) and outputs to pin 1 (3.5 V).
- Vertical Oscillator (Sawtooth Shaper):** Receives input from pin 18 (4 V) and outputs to pin 15 (3 V).
- Vertical Pre-driver:** Receives input from pin 15 (3 V) and outputs to pin 13 (0 V).
- Vertical Blanking Pulse:** Receives input from pin 13 (0 V) and outputs to pin 12 (0 V).
- Horizontal Oscillator:** Receives input from pin 5 (6 V) and outputs to pin 6 (6 V).
- X-Ray Protector:** Receives input from pin 6 (6 V) and outputs to pin 7 (6 V).
- Horizontal Pre-driver:** Receives input from pin 7 (6 V) and outputs to pin 10 (13.1 V).
- Shunt Regulator:** Receives input from pin 10 (13.1 V) and outputs to pin 11 (13.1 V).
- AFC (Automatic Frequency Control):** Receives input from pin 4 (6 V) and outputs to pin 3 (4 V).

μPC1378H Section:

- Vertical Deflection:** Receives input from pin 2 (0 V) and outputs to pin 3 (3.5 V).
- Voltage Booster:** Receives input from pin 3 (3.5 V) and outputs to pin 7 (3.5 V).
- Blanking Pulse width Adj.:** Receives input from pin 7 (3.5 V) and outputs to pin 5 (5 V).

Power Supply and Timing:

- VCC1 = 12 V:** Connected to pins 21 and 22.
- VCC2 = 110 V:** Connected to pin 11.
- VCC3 = 24 V:** Connected to pin 5.
- Timing Waveforms:** FBP (Frame Blanking Pulse) and Vp-p (peak-to-peak voltage) are shown for various pins.