

# BIPOLAR ANALOG INTEGRATED CIRCUIT

## $\mu$ PC1377C

### SYNCHRONIZATION SIGNAL PROCESSOR OF COLOR TV

#### DESCRIPTION

The  $\mu$ 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.

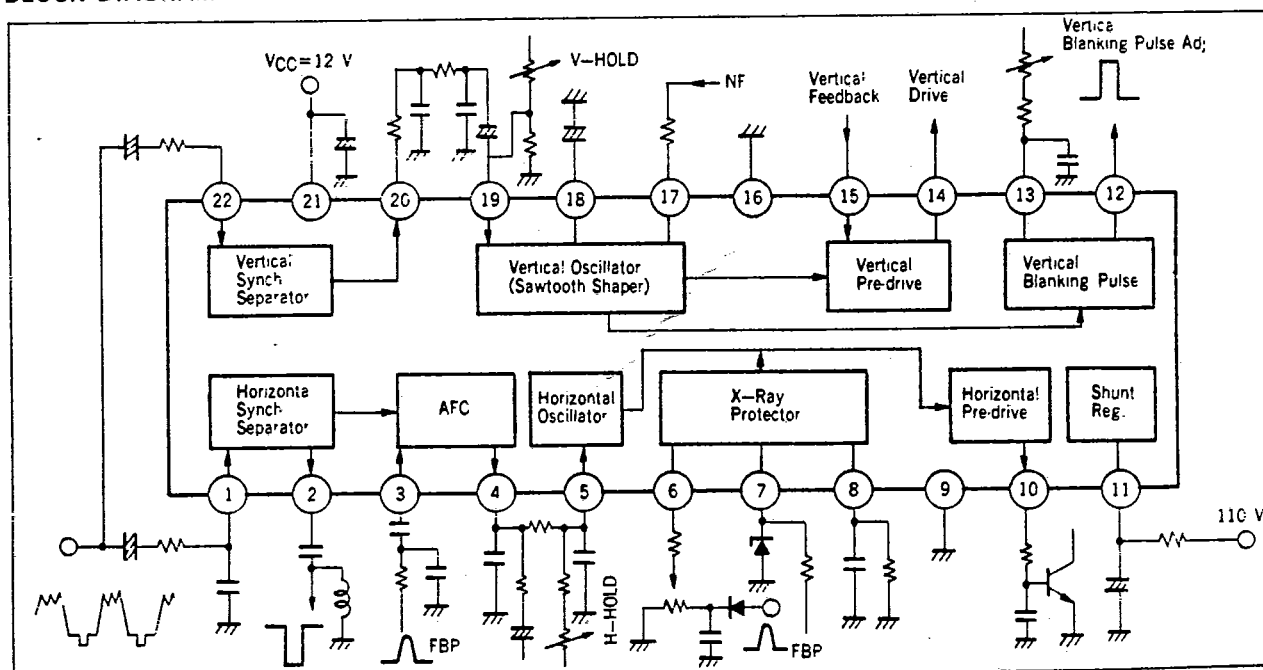
The horizontal part can take the operation current from high +B line as it has a shunt type regulator in it.

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

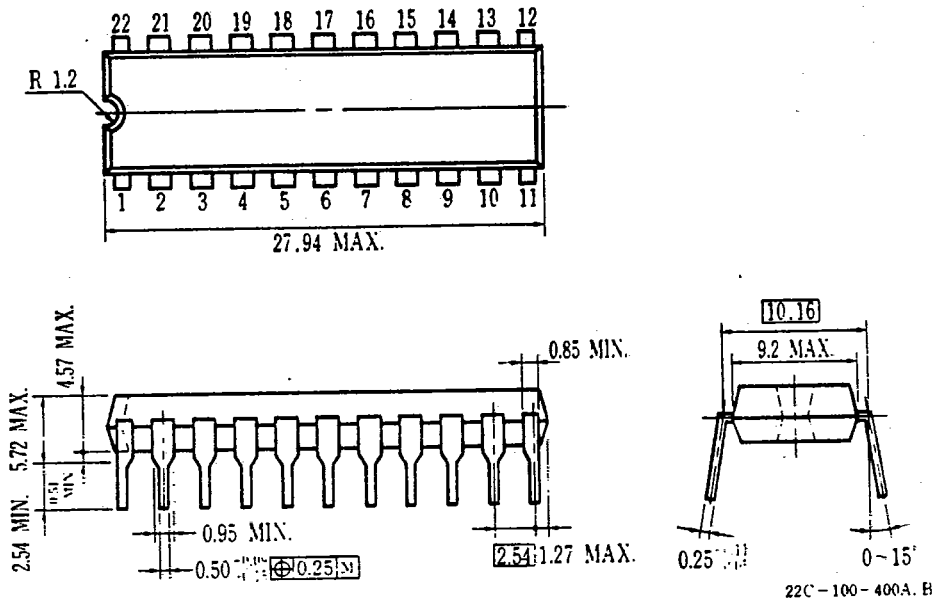
- Provided two synchronous signal separators realizes very stable synchronization, as they are provided each of horizontal signal and vertical one independently.
- Remarkably improved interlace tracking brought by the completely separated wiring in horizontal part and vertical one.
- Vertical retrace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

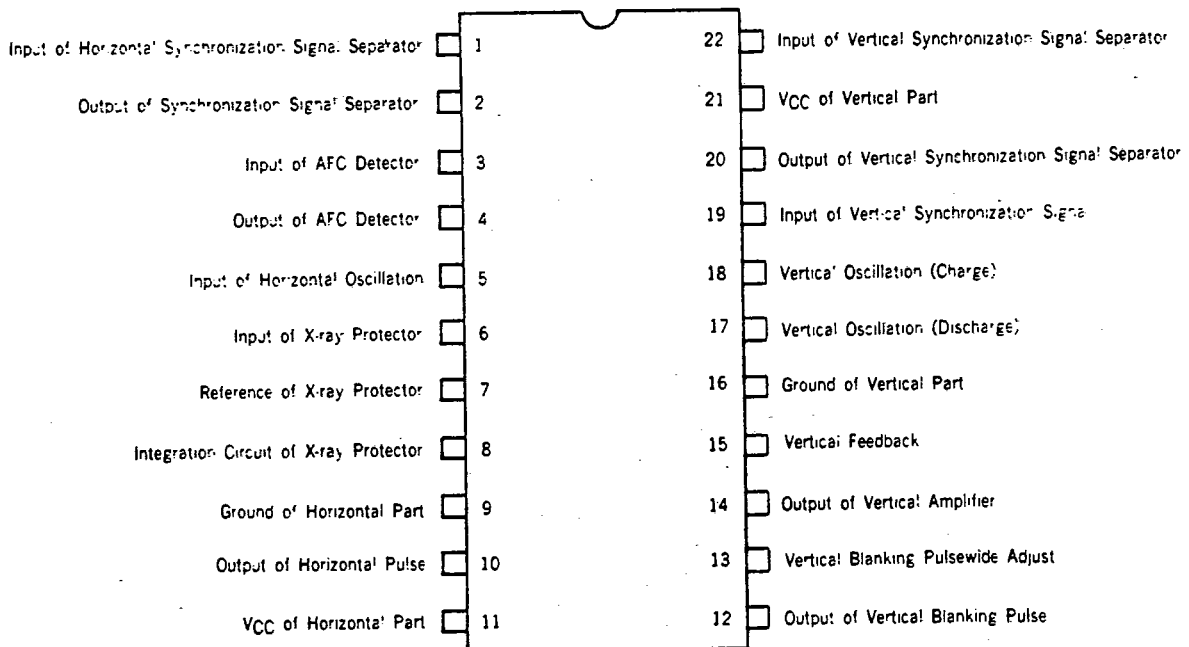


PACKAGE DIMENSIONS (Unit : mm)

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 |

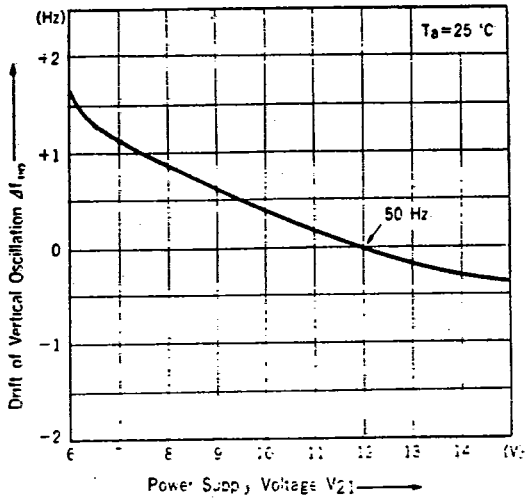
ELECTRICAL CHARACTERISTICS ( $T_a=25^\circ\text{C}$ )( $V_{21} = 12\text{ V}$ ,  $I_{11} = 15\text{ mA}$ , Standard Circuit)

| 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              | $f_{v0}$                | 48        | 50        | 53        | Hz                       | $C_{18}=1\ \mu\text{F}$ , $R_{17}=33\ \text{k}\Omega$                       |
| Drift of Vertical Free-running Frequency     | $\Delta f_{v0}(V_{CC})$ | 0         | 0.8       | 1.0       | Hz                       | $\Delta f_{v0}(V_{CC})=f_{v0}(9.6\text{ V})-f_{v0}(14.4\text{ V})$          |
| Drift of Vertical Free-running Frequency     | $\Delta f_{v0}(T_a)$    | 0         | 0.6       | 1.0       | Hz                       | $\Delta f_{v0}(T_a)=f_{v0}(-20^\circ\text{C})-f_{v0}(+75^\circ\text{C})$    |
| 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                       | $C_{13}=0.047\ \mu\text{F}$ , $R_{13}=30.75\ \text{k}\Omega$                |
| Retrace Pulse Width (2)                      | $RPW(2)$                | -1.9      | 2.0       | 2.1       | ms                       | $C_{13}=0.1\ \mu\text{F}$ , $R_{13}=28.5\ \text{k}\Omega$                   |
| 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   | $f_{pH}$                | $\pm 500$ | $\pm 700$ | $\pm 900$ | Hz                       | $C_5=5\ 600\ \text{pF}$   |
| Efficiency of Horizontal Oscillation Control | $\beta$                 | 38        | 40        | 45        | Hz/ $\mu\text{A}$        |   |
| Gain of AFC Detector                         | $\mu$                   | 190       | 300       | 420       | $\mu\text{A}/\text{rad}$ |   |
| Horizontal Free-running Frequency            | $f_{HO}$                | 15.00     | 15.75     | 16.50     | kHz                      | $C_5=5\ 600\ \text{pF}$ , $R_5=14.5\ \text{k}\Omega$                        |
| 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      | $\mu\text{s}$            |   |
| 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                        | $V_7 = 6.2\text{ V}$  |

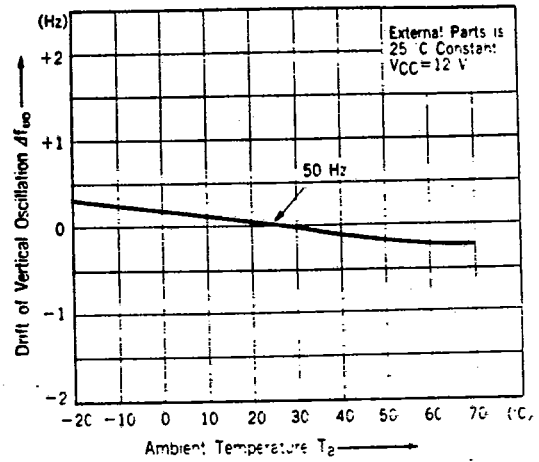
**TYPICAL CHARACTERISTICS ( $T_a = 25^\circ\text{C}$ )**

**1. Vertical part**

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

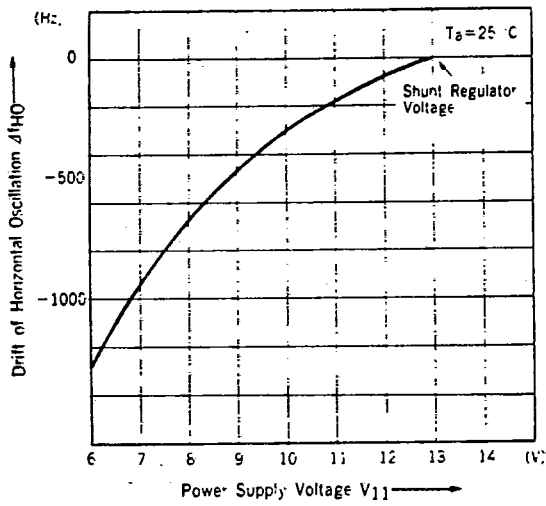


**DRIFT OF VERTICAL OSCILLATION AGAINST AMBIENT TEMPERATURE**

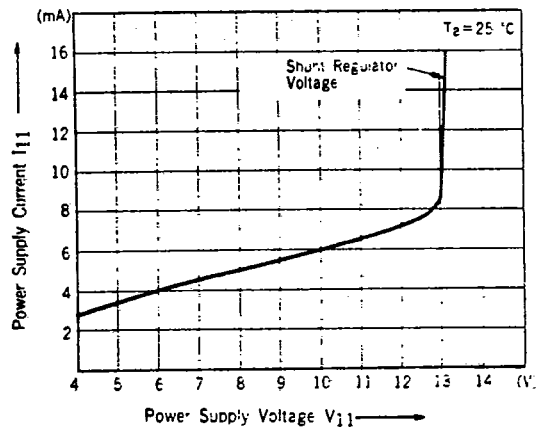


**2. Horizontal part**

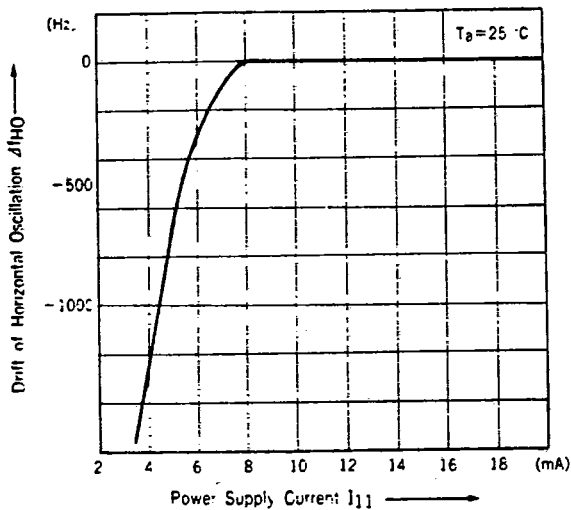
**DRIFT OF HORIZONTAL OSCILLATION AGAINST POWER SUPPLY CURRENT**



**POWER SUPPLY CURRENT vs. POWER SUPPLY VOLTAGE**



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



**DRIFT OF HORIZONTAL OSCILLATION AGAINST TEMPERATURE**

