Ordering number : EN4305A

CMOS LSI

SANYO

No. 4305A

# LC7444

## Dual VCO

## Overview

The LC7444 consists of two independent VCO (voltage controlled oscillator) circuits.
These circuits support VCO operation with only the addition of external resistors that determine the oscillation range.

## Features

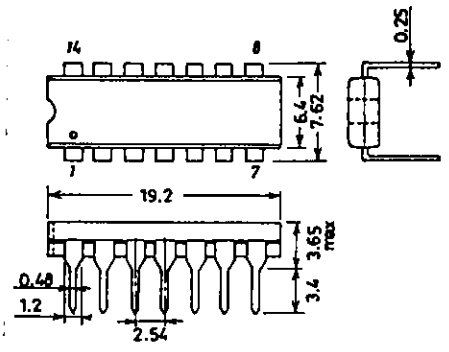
- Two independent VCO circuits
- The oscillator frequency range can be set with external resistors.
- Good linearity in the voltage - frequency conversion characteristics
- High-impedance oscillator control voltage input
- CMOS clock output
- Fabricated in a CMOS process for lower power
- Oscillator frequency range: 8 to 32 MHz
- Operating supply voltage: 5 V ± 10%
- Package: DIP14

## Package Dimensions

unit: mm

**3003A-DIP14**

[LC7444]




SANYO: DIP14

## Specifications

### Absolute Maximum Ratings at Ta = 25 ± 2°C, $V_{SS}1 = V_{SS}2 = 0$ V, $V_{DD} = V_{DD}1, V_{DD}2$

| Parameter | Symbol | Conditions | Ratings | Unit |
|---|---|---|---|---|
| Maximum supply voltage | $V_{DD}$ max | | −0.3 to +7.0 | V |
| Maximum input voltage | $V_{IN}$ max | | −0.3 to $V_{DD}$ + 0.3 | V |
| Maximum output voltage | $V_{OUT}$ max | | −0.3 to $V_{DD}$ + 0.3 | V |
| Allowable power dissipation | Pd max | | 300 | mW |
| Operating temperature | Topr | | −10 to +70 | °C |
| Storage temperature | Tstg | | −55 to +125 | °C |

### Allowable Operating Ranges at Ta = −10 to +70°C, $V_{SS}1 = V_{SS}2 = 0$ V, $V_{DD} = V_{DD}1, V_{DD}2$

| Parameter | Symbol | Conditions | min | typ | max | Unit |
|---|---|---|---|---|---|---|
| Supply voltage | $V_{DD}$ | | 4.5 | 5.0 | 5.5 | V |
| Input high level voltage | $V_{IH}$ | $\overline{ENA1}$, $\overline{ENA2}$ | 0.7 $V_{DD}$ | | | V |
| Input low level voltage | $V_{IL}$ | $\overline{ENA1}$, $\overline{ENA2}$ | | | 0.3 $V_{DD}$ | V |
| Oscillator range resistors | Rrng | R1, R2 | 6.8 | | 13 | kΩ |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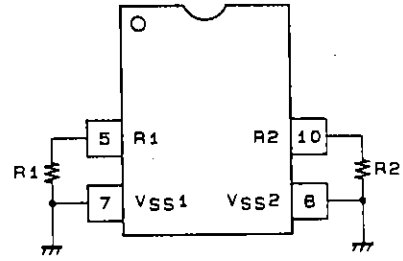
## Electrical Characteristics at Ta = 25 ± 2°C, $V_{DD}$ = 5 V ± 10%, $V_{SS}1 = V_{SS}2$ = 0 V, $V_{DD} = V_{DD}1, V_{DD}2$

| Parameter | Symbol | Conditions | min | typ | max | Unit |
|---|---|---|---|---|---|---|
| Output high level voltage | $V_{OH}$ | OUT1, OUT2: $I_{OH}$ = −1 mA | $V_{DD}$ − 0.4 | | | V |
| Output low level voltage | $V_{OL}$ | OUT1, OUT2: $I_{OL}$ = 1 mA | | | 0.4 | V |
| Quiescent current | $I_{DDS}$ | $\overline{ENA1}$, $\overline{ENA2}$ = $V_{DD}$, FC1, FC2 = $V_{SS}$ | | 2 | | mA |
| Operating current drain | $I_{DD}$ | R1 = R2 = 7.5 kΩ, no output load, oscillator clock = 20 MHz | | 7 | | mA |
| Input leakage current | $I_{IH}$, $I_{IL}$ | | −1 | | +1 | μA |
| Oscillator clock frequency operating range | fo | R1, R2 = 6.8 kΩ, FC1, FC2 = $V_{SS}$ to $V_{DD}$ *1 | 16 | | 32 | MHz |
| | | R1, R2 = 13 kΩ, FC1, FC2 = $V_{SS}$ to $V_{DD}$ *1 | 8 | | 16 | MHz |
| Duty | Du | *2 | | 50 | | % |

Note: 1.

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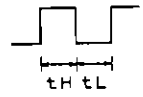
2. Duty: Du

$$Du = \frac{tH}{tH + tL} \times 100$$

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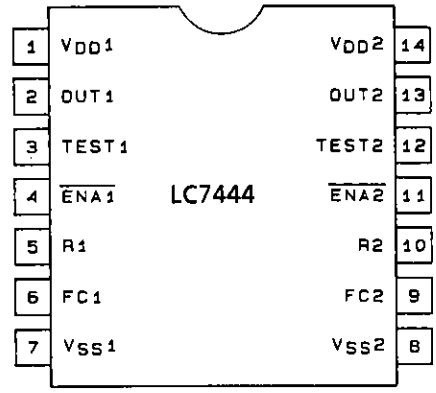
## Pin Assignment




Top view A00924

## Pin Functions

| Pin No. | Symbol | Function |
|---|---|---|
| 1 | $V_{DD}1$ | Power supply |
| 2 | OUT1 | VCO1 clock output |
| 3 | TEST1 | Test pin. Must be tied low in normal operation. |
| 4 | $\overline{ENA1}$ | VCO1 enable input |
| 5 | R1 | VCO1 oscillator range resistor |
| 6 | FC1 | VCO1 control voltage input |
| 7 | $V_{SS}1$ | Ground |

| Pin No. | Symbol | Function |
|---|---|---|
| 8 | $V_{SS}2$ | Ground |
| 9 | FC2 | VCO2 control voltage input |
| 10 | R2 | VCO2 oscillator range resistor |
| 11 | $\overline{ENA2}$ | VCO2 enable input |
| 12 | TEST2 | Test pin |
| 13 | OUT2 | VCO2 clock output |
| 14 | $V_{DD}2$ | Power supply |

## Sample Application