Category: Oscillators **CIRCUIT IDEAS FOR DESIGNERS** Schematic no. osc_42002.0

# RC Oscillation Circuit

## Description

This is a simple RC type of oscillator circuit. It consists of three inverter stages with a two-resistor feedback resistor network and an oscillator capacitor $C_{OSC}$. The output of the oscillator is at $V_A$. Assuming $V_A$ is at a high voltage state initially, $C_{OSC}$ charges toward a high-level voltage. When it reaches a threshold voltage at the first stage inverter, the first stage inverter inverts its output to low-level voltage. The next stage of inverter is then inverted towards a high-level voltage, which then in turn inverts the third stage towards a low-voltage level. The cycle continues by now discharging the $C_{OSC}$ capacitor towards a low-level voltage. Once the capacitor voltage crosses the threshold of the first stage inverter, the inverter output siwthces to low-level again. This process continues until the output voltage of the third stage again is at a high level. The circuit oscillates at a frequency determined by the R C time constant and the propagation delay of the inverters. $V_A$ at the output is a square wave, which is then buffered through a fourth inverter stage to produce the output at $V_B$. Often the fourth stage inverter also acts as a voltage level translator, which now produces $V_B$ as a square wave with output amplitude different from $V_A$. ALD1108xx MOSFET inverters can be built that operates this RC oscillator on 0.2V and nanowatt power dissipation.

For full schematic diagram and notes, please register and login at aldinc.com