ALD555 Oscillation Circuit

Description

This is a basic oscillator circuit using a 555 type of timer. Initially circuit is configured as an astable multivibrator, with the oscillation frequency given by \( f = \frac{1}{1.4 \times R \times C_1} \). Initially, with voltage on Output (pin3) high, \( C_1 \) charges towards \( \frac{2}{3} V^+ \). When \( C_1 \) voltage reaches that threshold level, the output driver on pin3 switches Output State and the Output Voltage is switched to a low level, discharging \( C_1 \) towards ground. When voltage on \( C_1 \) is discharged to \( \frac{1}{3} V^+ \), it triggers the comparator inside pin2, which then switches state of the Output State again towards a high and starts the \( C_1 \) charging cycle again. Hence through the charging and discharging cycles, an oscillator circuit is implemented. Using CMOS versions of 555 timer circuits, a very wide frequency range at very low level of voltage spikes and power dissipation can be achieved. Selection of the value of \( R \) is limited by the input leakage specifications of the timer at pin2 and pin6. \( R \) resistor value is also limited by the leakage current at the capacitor \( C_1 \). \( C_1 \) usually have a range from 10,000\( \mu F \) down to 0. When \( C_1 \) is at 0 value, the timer circuit will oscillate without an external \( C_1 \), in which case the internal parasitic capacitor \( C_{1_int} \) inside the 555 timer takes over.

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