PCB (Printed Circuit Board) Design of the Servo motor tester built using a 555 timer IC

Servo Motor Tester – A Compact PWM-Based Diagnostic Tool

The **Servo Motor Tester** is a compact and efficient hardware tool designed to test and calibrate standard servo motors used in embedded and IoT applications. Built around a 555 Timer IC, the tester generates PWM (Pulse Width Modulation) signals to simulate the control input typically provided by microcontrollers like Arduino, ESP32, or Raspberry Pi.

With a built-in potentiometer, users can manually vary the PWM duty cycle, allowing precise control over the servo's angle of rotation. The design also includes LED indicators for power/status and a standard 3-pin output header compatible with most hobby servo motors (SG90, MG996R).

This project is especially useful for

1. IoT students and hobbyists for quick servo diagnostics
2. Embedded system developers during hardware prototyping
3. Robotics teams and lab setups for reliable actuator testing

Key Features of the design

1. PWM generation using 555 timer IC (no microcontroller required)
2. Manual angle control via potentiometer (RV1)
3. Standard servo output interface (GND, VCC, Signal)
4. On-board power filtering and indicator LED
5. Clean, compact PCB layout with custom silkscreen design
6. Plug-and-play usability — perfect for rapid servo testing