

TRIAC BASED FOUR STEP TOUCH DIMMER

Abstract:

This project is designed to increase the light intensity of incandescent lamps in three steps by simply touching. The touch dimmer is built around 8-pin CMOS IC TT8486A/TT6061A specifically manufactured for touch dimmer applications. Initially, when mains switch is 'on,' the bulb is 'off'. Now, if you touch the touch plate, the bulb glows dimly. On second touch, the bulb gives medium light. At the third touch, the bulb is driven fully. Another touch puts off the light. Since the IC is highly sensitive, use a long wire to connect the IC to the touch sensor. The circuit uses minimum external components. For touch plate, you can use a simple copper plate of 1cm×1cm or even the end of the lead wire. Touch plate is coupled to the touch detector through 820pF, 2kV capacitors C1, C2, and C3 connected in series. Internally IC TT6061A's touch signal is connected to the counter/decoder via a resistor and clock input CK is connected to the counter/decoder via a frequency generator.

Line frequency signal is taken through R4 at pin 2 of IC TT6061A. At zero crossing, the triac (BT136) triggers to drive a 200W bulb. The 6.8V power supply is taken directly from mains through resistors R1 and R3, diode D3, capacitor C4, and zener diode and fed to power-input pin 3 of the IC. Capacitors C1, C2, and C3 connected between touch input pin 4 and touch plate remove the shock potential from the touch plate, so do not replace these capacitors with a single capacitor or with a capacitor of a lower voltage rating. Mains potential exists in the circuit. Needless to say, it is dangerous to touch the circuit when mains is 'on.'

In this project we are going to design and analyze the circuit in matlab simulink. Simulink is tools through which we can analyze the output before it get practically implemented. Simulink is an environment for multidomain simulation and model-based design for dynamic and embedded systems. it provides an interactive graphical environment and a customizable set of block libraries that let you design, simulate, implement, and test a variety of time-varying systems, including communications, controls signal processing, video processing, and image processing.

