

Electronics Online Challenge Sponsored by Texas Instruments

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Introduction:

We selected a Philips TV Remote Control because we had one and we thought it wouldn't be too complicated to document.

Inside we found:

1. (2) AAA Batteries: 1.5V Zinc Carbon, Philips Brand
2. Hard plastic cover
3. Rubber button pad
4. C1: Capacitor: 10V 47uF Straight line Frequency
5. x1: Ceramic Resonator
6. DIP (dual inline package) 16 pin integrated circuit
7. R1: Resistor, 2RD
8. R3: Resistor, EEE
9. R4: Resistor, EEE
10. Q1: Transistor, J3Y
11. D1: LED infrared diode

No components were clearly identified as Texas Instruments.

What do these components do?

Capacitor: The capacitor is a cylinder with two metal plates separated by a non-conductive material. It builds up voltage and stores the energy like a battery. It discharges all at once. This capacitor is most likely filled with air. Air is used frequently in radio circuits.

Resonator: The resonator amplifies the frequency the capacitor is producing. It works as a tuner.

DIP (dual in-line package) 16 pin Integrated Circuit: The DIP has two parallel rows of electrical connecting pins. It is the microchip. All the parts are printed on it. The advantages of using a DIP are: small, easy connections, cheap, and it is fast to install.

Resistor: The resistor slows the power by using a not very conductive material to limit the electron flow. It can only use power, not generate power. There are two kinds of resistors: surface mount and thru hole. This one is a surface mount. It is a small black rectangle installed by a robot. There are letters on the resistor that can be decoded to tell you the resistance in ohms of the resistor.

Transistor: The transistor works like a simple switch. If voltage is applied, the switch turns on. When no voltage is applied, the switch is off. There are two varieties: NPN (neutral positive neutral) and PNP (positive neutral positive).

LED Infrared Diode: The Infrared light is invisible to the naked eye. The diode is a cheap and efficient way to produce infrared light. It is used to communicate with the TV.

Conclusion:

In this challenge, we learned how to carefully take apart electronics and document them. We learned electronic components are very interesting, but also hard to understand.

PHOTO 1



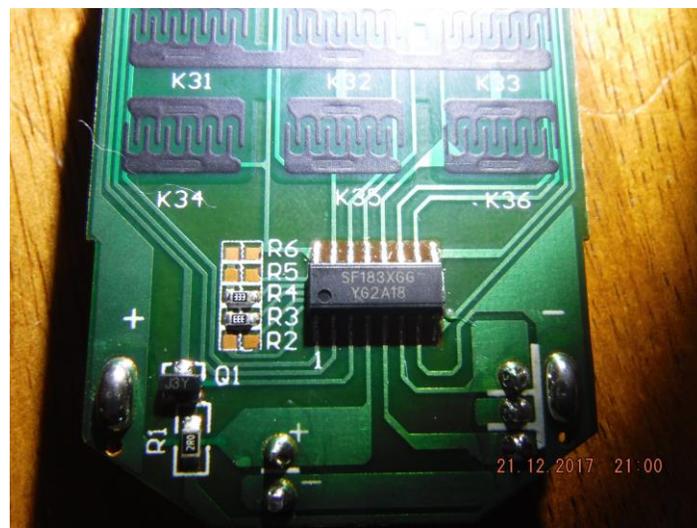
Disassembled Philips TV Remote Control

PHOTO 2



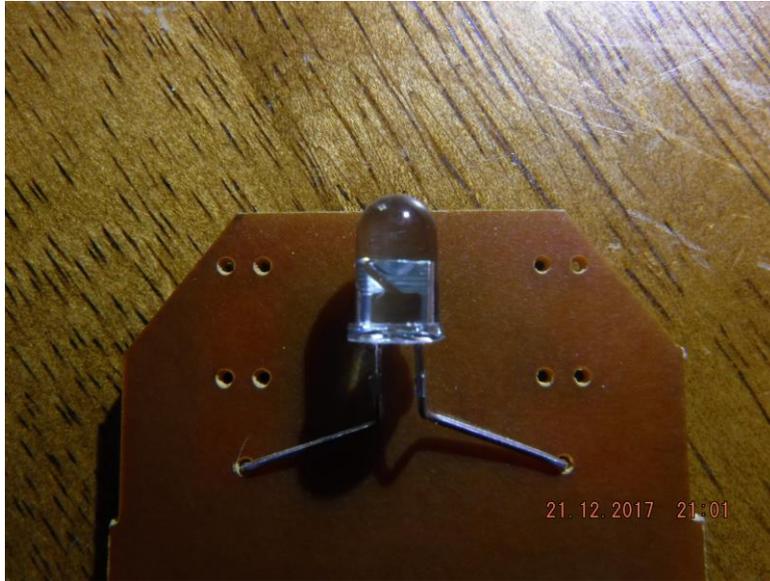
x1 Resonator on left, c1 Capacitor in middle

PHOTO 3



Back of Philips TV Remote Control
R1, R3, R4 Resistor
DIP 16 Pin Integrated Circuit
Q1 Transistor

PHOTO 4



LED Infrared Diode