

Pikatel Airmax-101 TTNet ADSL Modem

Legacy Turkey/İstanbul

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Introduction

How did we decide to disassemble it?

The Pikatel Airmax-101 TTNNet ADSL Modem is a computer hardware device that translates data from an electronic medium to an analogue version that may be used on a phone or a radio. It supports 802.11g and has a wifi speed of 54 Mbps. This modem is capable of supporting four 10/100 Mbps Ethernet wireless LAN access points. We found this device at the house of one of our team members, Eren, and decided to reverse engineer it.

Disassembly Process

Procedure

First, for safety, we cleared the workspace and wore goggles and glasses. Then we started by unscrewing the back panel of the modem and taking out the circuit board. After taking a photo of the circuit board we took out the clips that hold the cables. Taking out the glue was a hard job and needed steady hands and a focused brain because if the knife slipped it could have damaged the circuit board. Finally we couldn't open the antenna because a plastic piece was holding it. However, after some strain it was open. And there we had the whole circuit board of the modem nice and cleaned up.

Circuit Overview

The PCB was the first item we looked at when we disassembled the modem. We looked at the modem's components to see what they were. As we discovered more components, we recorded how many were on the PCB. Then we did some research on these components to figure out what they were used for, and then we photographed them and included them in our study. Finally, we summarized the purposes of the modem's components.

Integrated Chips

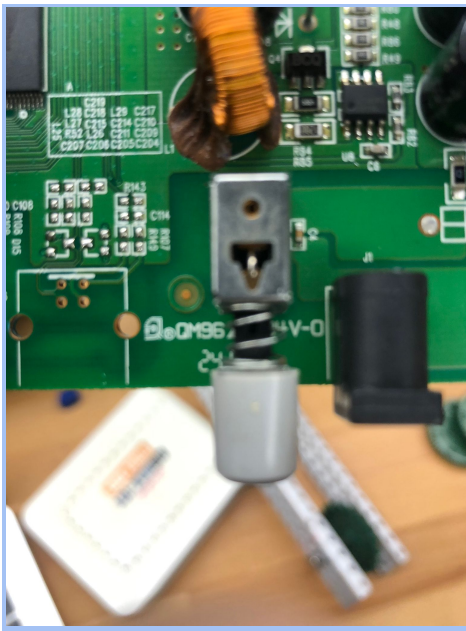
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Electronic Components

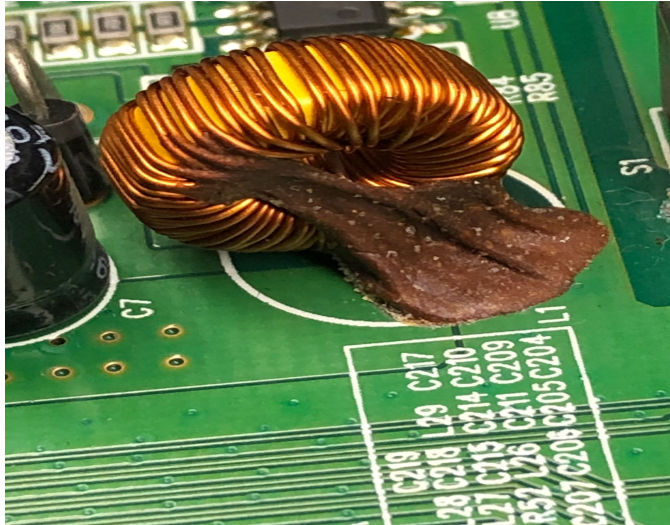
Transistors

A transistor can be thought of as a switch but rather than a switch controlled by a lever, it is a switch that switches a big current.



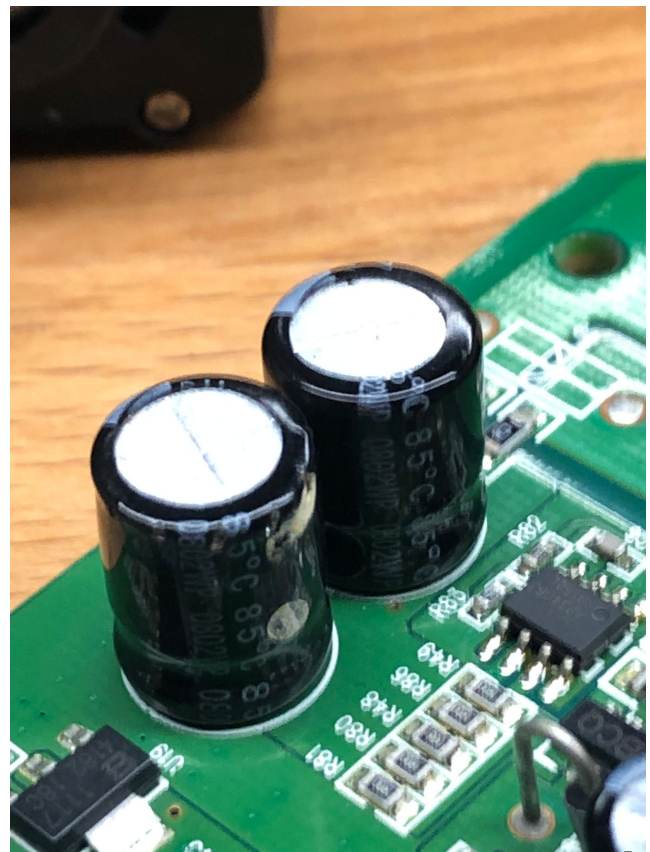
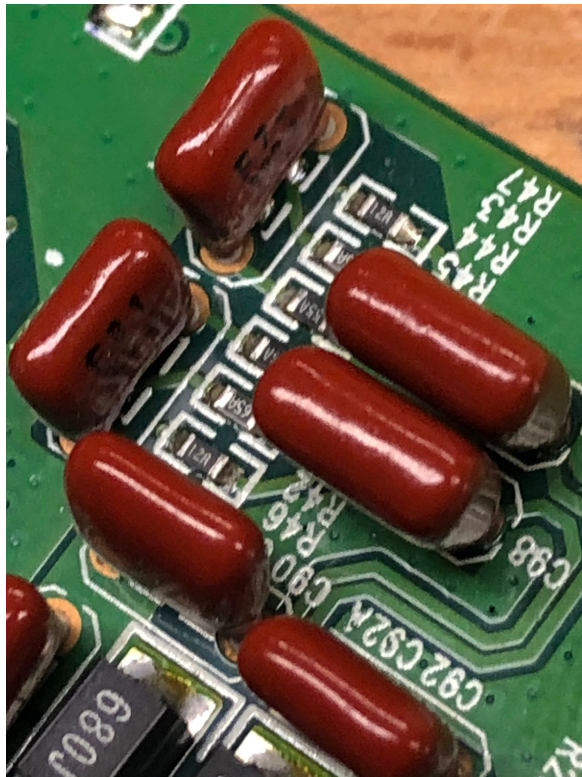
Inductors

Inductors are the energy storage unit for the circuit. It gives energy to the circuit when the device is turned off. Thus enabling output voltage exceeds input voltage.



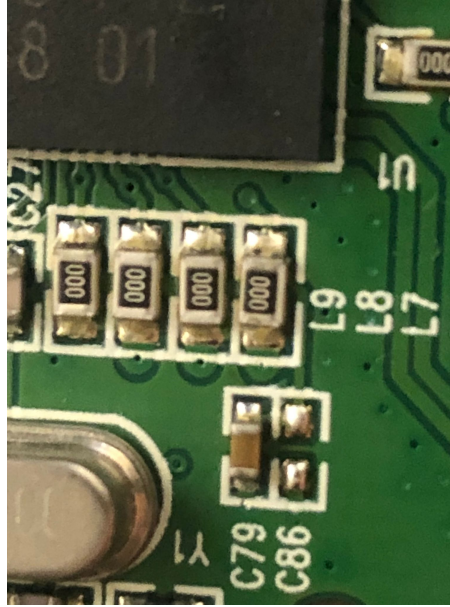
Capacitors

Capacitors are often used to head off problems like the instability of a circuit or unwanted noise. They can store the charge and release it really quickly. Capacitors are replaced parallel with the signal path. The electronic device we chose includes 25 capacitors.



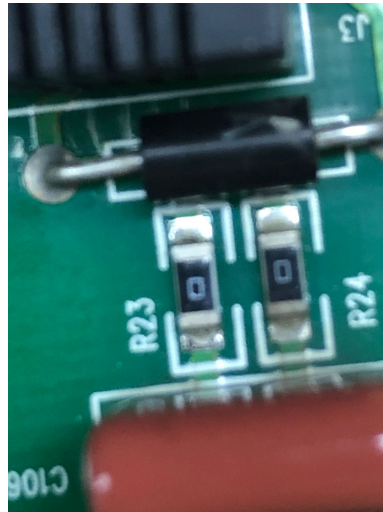
Resistors

Resistors are common elements of electrical networks and electronic circuits and are ubiquitous in electronic equipment. Practical resistors as discrete components can be composed of various compounds and forms. Resistors are also implemented within integrated circuits.



Diodes

Diodes are also known as rectifiers. A rectifier is a semiconductor device that essentially acts as a one-way switch for current. It allows current to flow easily in one direction, but severely restricts current from flowing in the opposite direction.



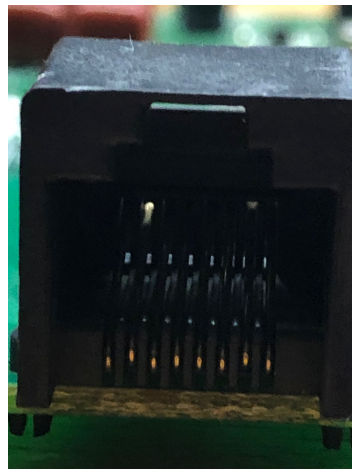
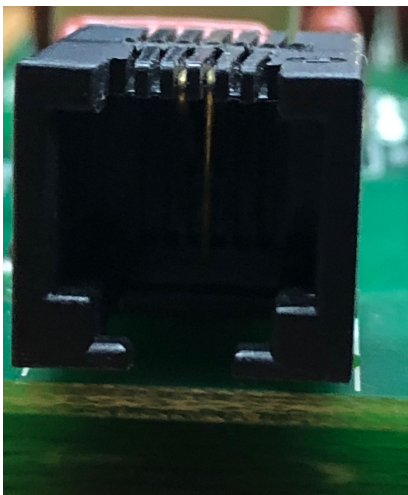
Antenna

The antenna is designed to radiate field lines with good directivity. In addition, unused areas are not or only very slightly irradiated. Due to the directivity, the gain of the radiation is higher, accordingly the range in this direction is also higher.



Ports, Connectors, Interface

First, the ethernet port on the modem is a PoE switch, which has Power over Ethernet capabilities built-in. This ensures that network cables can be used to power devices. A PoE switch offers power over Ethernet that may be used to power other devices. Second, the power switch is a standard ROHS switch, which is also used for resetting the device in order to cut down the connection. It also contains an ethernet port for wired wifi and a power port for connecting to a power source.



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